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IN THE

Supreme Court of the United States

OCTOBER TERM, 1977

No. 76-419

VERMONT YANKEE NUCLEAR POWER CORPORATION,
Petitioner,

v.

NATURAL RESOURCES DEFENSE COUNCIL, INC., *et al.*,
Respondents.

No. 76-528

CONSUMERS POWER COMPANY,
Petitioner,

v.

NELSON AESCHLIMAN, SAGINAW VALLEY NUCLEAR STUDY GROUP, *et al.*,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit

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BRIEF FOR *AMICUS CURIAE* UNION OF CONCERNED SCIENTISTS FUND, INC. IN NO. 76-419

Of Counsel:
JAMES N. BARNES
Center for Law and Social Policy
Washington, D.C. 20036

GEORGE C. DEPTULA
1208 Massachusetts Avenue
Cambridge, Massachusetts 02138
Attorney for Amicus Curiae Union of Concerned Scientists Fund, Inc.

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BRIEF FOR *AMICUS CURIAE* UNION OF CONCERNED SCIENTISTS FUND, INC. IN NO. 76-419

INTERESTS OF *AMICUS CURIAE*

The Union of Concerned Scientists Fund, Inc. ("UCS")[1] files this brief *amicus curiae* in No. 76-419

[1] The organization is commonly know as the "Union of Concerned Scientists". It participated in the uranium fuel cycle rulemaking hearing (*App.* 352-400, 538-1339) under that name.

by consent of all parties. Copies of the letters of consent have been filed with the Clerk.

UCS is a non-profit public corporation which conducts scientific and technical research concerning the social impact of advanced technologies. The organization was originally founded in the late 1960's as an informal faculty group at the Massachusetts Institute of Technology. It has grown into a coalition of scientists, engineers and other professionals concerned primarily with various health, safety, environmental and national security problems posed by the development of nuclear power plants in this country and abroad. UCS regularly prepares technical reports on various aspects of nuclear technology.[2] Its technical research is undertaken by a small staff in conjunction with contributions from broad segments of the scientific community in universities and other research organizations. UCS has a current public membership of approximately 35,000 sponsors who have contributed financially to support its work on nuclear technology issues.

Supplementary to its technical research activities, UCS's principal objective is to disseminate its independent analyses and judgments concerning issues associated with nuclear technology as widely as possible to the public. As a result of its work on nuclear power, over 2500 members of the American technical community endorsed the conclusions stated in a "Declaration on Nuclear Power" submitted by UCS to the Congress and the President on August 6, 1975. This declaration concluded, *inter alia*, that:

> ". . . nuclear fission creates massive amounts of radioactive by-products posing grave potential hazards which can only be controlled by an exceedingly high level of care, perception and diligence . . . .

[2] UCS's principal publication relating to the issues presented in these proceedings is: *The Nuclear Fuel Cycle: A Survey of the Public Health, Environmental, and National Security Effects of Nuclear Power* (M.I.T. Press rev. ed. 1975).

> No technically or economically feasible methods have yet been proven for the ultimate disposal of radioactive waste: a grim legacy from the nuclear program to future generations. Several proposals for dealing with the wastes exist, and one or more of these approaches may eventually be shown to be satisfactory, but important questions remain unanswered today about all of them." [3]

UCS's view is that "important questions [which] remain unanswered" about radioactive waste management and disposal have not been disclosd to the public by the Commission in a manner consistent with the National Environmental Policy Act of 1969 ("NEPA"). Unlike the federal respondents (Brief for Federal Respondents, page 34), UCS urges that a very substantial question under NEPA is presented for resolution by this Court. It is the position of UCS that the United States Nuclear Regulatory Commission,[4] when licensing nuclear power plants, has a legal responsibility under NEPA to develop a record disclosing to the public: (1) the present hazard

[3] A representative number of scientists who endorsed UCS's 1975 declaration have sponsored this brief. These individuals, whose affiliations are included solely for identification purposes, are: Hannes Alfven, Professor of Physics, University of California at San Diego and The Royal Institute of Technology, Stockholm, Sweden (Nobel Laureate); Christian B. Anfinsen, Chief, Laboratory for Chemical Biology, United States National Institute of Health (Nobel Laureate); James B. Conant, President Emeritus of Harvard University; John T. Edsall, Professor of Biochemistry Emeritus, Harvard University; Paul Kirkpatrick, Professor of Physics Emeritus, Stanford University; Salvador E. Luria, Professor of Biology, Massachusetts Institute of Technology (Nobel Laureate); Albert Szent-Gyorgyi, Director, National Foundation for Cancer Research (Nobel Laureate); James D. Watson, Professor of Biology, Harvard University, Director, Cold Spring Harbor Laboratory (Nobel Laureate).

[4] The United States Nuclear Regulatory Commission was created by the Energy Reorganization Act of 1974, 42 U.S.C. §§ 5801 *et seq.*, 5841 *et seq.*, succeeding the United States Atomic Energy Commission as the regulatory agency with licensing responsibilities for nuclear power plants. The word "Commission" is used in this brief to refer to both the NRC and the AEC.

created by producing radioactive waste; (2) the means of developing technologies designed to minimize the hazard; and (3) unresolved problems involved in the application of technologies to isolate radioactive wastes. UCS's principal objection to the Commission's actions is the inadequate quality of disclosure of these most serious environmental concerns. Many facts and uncertainties have not been considered by the Commission in a meaningful way and have not been disclosed to the public.

The interests of UCS, including its public membership and the scientists who have assisted in its research and policy positions, are adversely affected by the Commission's failure to examine in full detail the environmental risks and costs of producing radioactive wastes in a nuclear power plant. Members of UCS live near and enjoy the environment surrounding nuclear power plant sites and the numerous locations being investigated by the government for radioactive waste disposal sites. They risk injury due to the possibility that projected plans will not prove adequate to store and to dispose of radioactive wastes from nuclear power plants. The following consequences flowing from the Commission's inadequate analysis of the problems posed by radioactive wastes will directly affect the interests of UCS's members: (1) additional nuclear power plants will be constructed without a thorough assessment of commitments necessary to protect the environment; (2) grave, long-term risks of environmental contamination from radioactive wastes produced by those plants will inevitably be created; (3) numerous waste disposal sites throughout the United States will have to be investigated, designed, and constructed; and (4) the opportunity for Congress and the public to review the Commission's choices as to further use of nuclear power on a fully informed basis will be foreclosed.

UCS members also are concerned about the costs and risks passed on to future generations since radioactive wastes will remain toxic for hundreds of thousands of

years. They believe that continued licensing of nuclear power plants without a thorough and detailed understanding of the present and future burden of controlling radioactive wastes will result in an undue reliance by the United States on nuclear power. UCS's members have an interest in seeing that their energy needs are met without placing the unnecessary burden of the costs of radioactive waste disposal upon future generations.

Finally, UCS has a substantial organizational interest in this case. The purpose of NEPA is to ensure that an agency, such as the Commission, gives appropriate consideration to environmental values through fair procedures, full public disclosure, and reasoned responses to problems raised by responsible, independent scientific analyses. By participating in the rulemaking proceeding conducted by the Commission concerning the environmental impact of producing radioactive wastes (*App.* 352-400, 538-1339), UCS brought to the Commission's attention a range of important questions and issues requiring consideration. These factors include an assessment of the history of previous radioactive waste management efforts and an analysis of the options available for long-term disposal. UCS maintains that previous errors in the nuclear community's attempts to find a solution to the radioactive waste problem, and the uncertainties concerning whether proposed technologies can be implemented successfully to dispose of radioactive wastes permanently, present serious environmental considerations. UCS's interest in participating in those proceedings was to present independent scientific opinions to the Commission for the purpose of promoting the informed public and congressional oversight of environmental choices mandated by NEPA.

As Judge Learned Hand noted, the judiciary often needs ". . . the aid of unpartisan and authoritative scientific assistance in the administration of justice." *Parke-*

Davis and Co. v. *H. K. Mulford Co.*, 189 Fed. 95, 115 (S.D.N.Y. 1911). This need is acute in the environmental context, where the judiciary must review complex technical decisions in order to determine whether all relevant facts were taken into account, *e.g.*, *Citizens to Preserve Overton Park* v. *Volpe*, 401 U.S. 402 (1971). UCS's position before this Court as *amicus curiae* is to indicate to the Court the failure of the Commission to respond to relevant considerations brought to its attention concerning radioactive waste management and disposal in the context of the *Vermont Yankee* licensing proceeding and the Table S-3 rulemaking.[4a]

STATEMENT OF THE CASE

A. Background

The factual issues raised in this case concern segments of the fuel supply system for uranium-fueled "light-water" nuclear power reactors. "Light-water" reactors, the principal reactor type used in this country, function by transferring to a natural water medium the heat generated by the fission of a particular uranium isotope. The transformation of natural uranium ore to a suitable form for reactor fuel, the use of the fuel for the production of electric power, and the subsequent management of the used

[4a] This brief deals solely with the nuclear fuel cycle issues subject to review in Docket No. 76-419 and is filed in Support of the Respondents in that case. However, UCS also urges affirmance of the Court of Appeal's decision in No. 76-528. In particular, the Commission's refusal to consider energy conservation issues in this Licensing case raises serious doubt concerning the willingness of the Commission to consider scientific and technical evidence in an open and fair manner. The techniques of energy conservation have been cited by the President as the "cornerstone of National Energy Policy. . . ." *The National Energy Plan*, Executive Office of the President, Energy Policy and Planning p. 28 (1977). The failure of the Commission to consider on its own initiative energy conservation as a reasonable alternative to licensing a nuclear power plant is both inconsistent with Presidential policy and indefensible as a scientific and environmental judgment.

uranium fuel comprise what is commonly designated the "uranium fuel cycle". This fuel cycle consists of a number of complex and discrete industrial and chemical processes, from the mining and milling of naturally occurring uranium ore to the ultimate management and disposal of used fuel and other radioactive waste by-products. The focus of this case is upon the environmental consequences of the segments of the uranium fuel cycle subsequent to the use of the fuel in light-water reactors.

The result of "burning" or "fissioning" of uranium fuel produces two categories of new radioactive substances. "Fission products," such as Strontium-90 and Cesium-137 are atomic "fragments" of split uranium atoms. "Actinides" and "transuranic elements," such as Plutonium-239, are all heavier atoms than uranium which are created when non-fissionable elements, usually Uranium-238, "capture" additional neutrons. The general term "radioactive wastes" refers to these substances contained in the used fuel elements along with plant structures, filters and other materials which become contaminated with these substances during the operation of the reactor, or activated by absorbing neutrons so as to become radioactive.

The risks of producing radioactive wastes by operating nuclear reactors arise from the extreme toxicity of fission products and actinides, and the consequent need to isolate these substances from bio-systems for periods of time which amount to "perpetual care" in comparison to human experience. Radioactive wastes include over 100 different "isotopes" or elements which are toxic and require environmental isolation. The most abundant and toxic long-term radioactive element in radioactive waste, posing a major health hazard, is Plutonium-239. With a half-life of approximately 25,000 years, Plutonium-239 must be isolated for 250,000 years before it becomes non-toxic. Plutonium's extreme toxicity is due to the fact that it

emits "alpha" radiation, a form of radiation of low penetration, which has a drastic impact upon exposed tissues. Even an exceedingly small particle of plutonium could cause lung cancer in a human being if inhaled. Plutonium accompanied by other actinides of comparable toxicity in used reactor fuel such as "amecurium" and "curium," will remain 1000 times more toxic than uranium ore for almost four million years while substances decay into stable, and thus radiologically benign, elements.[5]

Other elements in reactor fuel are shorter-lived but of equal concern in health and environmental terms. Strontium-90 and Cesium-137, two prevalent fission products, emit a type of radiation which can penetrate anything short of a thick shield of lead or concrete. They pose a hazard from *mere proximity*, and require isolation from the environment for "only" 600 to 1000 years in containers designed to block radiation and yet provide sufficient cooling to disperse the heat generated by radioactive decay. Strontium-90 is especially dangerous to humans, because of its chemical similarity to calcium. If ingested or absorbed in the human body, Strontium-90 lodges in bone cells and radiates the surrounding tissue continuously. Other elements in radioactive waste fuel have equally significant health effects because of their concentration in particular organs in the human body. For instance, the two radioactive isotopes of Iodine, Iodine-129 (with a half-life of 17 million years) and Iodine-131 (with a half-life of approximately 8 days) would, if ingested, concentrate in the thyroid gland. An isotope of Thechnetium concentrates in the gastrointestinal tract.

The adverse health effects caused by the absorption of these and other radioactive elements into human and other living tissue include the development of cancer in exposed tissues and possible genetic damage which would be

[5] *See generally, App.* 1075-79.

passed on to future generations in the form of various birth defects, mutations and diseases. *See, App.* 850-860. The realization of these adverse effects depends primarily upon the available environmental pathways through which radioactive wastes could impact directly upon human tissues. These pathways include direct inhalation from the atmosphere, absorption through drinking contaminated water, and exposure through a variety of plausable food chains in which radioactive elements have been concentrated, as well as mere proximity to certain elements such as Cesium-137. The goal of disposing of radioactive wastes is to close off all pathways through which the radioactive elements could come into contact with the human environment.

Unlike the steps associated with the production of uranium fuel, the adverse environmental consequences and the costs which must be incurred in order to implement measures to protect the environment and people from exposure to and injury from radioactive wastes are problematic and uncertain. The development and promotion[6] of nuclear power as a means of generating electricity over the past thirty years has given us substantial experience with the environmental effects of producing necessary supplies of uranium fuel. Accordingly, each step of the production of uranium fuel involves known environmental impacts, adverse consequences and resource commitments which have been previously experienced, and can be defined relatively easily on the basis of existing data. In contrast, most of the technologies and development steps

[6] The former Atomic Energy Commission had the dual responsibility of both regulating and promoting the construction of nuclear power plants. *See*, 42 U.S.C. §§ 2011-13. The Energy Reorganization Act of 1974 was passed in large measure to separate the regulation of nuclear power from its promotion. 42 U.S.C. § 5801(c); *see*, S. Rep. No. 93-980, 93d Cong., 2d Sess. 14-20 (1974) reprinted at 1974 U.C. Code and Cong. News 5470, 5483-89 (1974).

associated with the long-term management and control of radioactive wastes remain undefined by experience.[7]

The basic principle of commercial nuclear waste management has been to concentrate and to contain radioactive wastes in such a manner that *residual effluents* are small enough to be effectively diluted and dispersed in natural environments so as to pose no appreciable harmful risk to the human environment.[8] Present management programs for radioactive wastes consist of two basic categories—"high-level" waste disposal and "low-level" waste disposal. "High-level" wastes consist of highly radioactive and toxic elements initially contained in, and later

[7] The United States Government has gained substantial experience with the short-term storage of radioactive by-product materials from the military nuclear weapons program. These materials have principally been stored in carbon steel tanks. However, other practices, such as ocean dumping and the direct ground burial, have also been utilized. *App.* 1081-84; *see generally*, Lash, *et al., Citizen's Guide: The National Debate on the Handling of Radioactive Wastes from Nuclear Power Plants* 28-33 (Natural Resources Defense Council 1975). These techniques have proven to be unsatisfactory due to leakage, and are inapplicable for the disposal of radioactive wastes from commercial nuclear power plants:

> "Methods which were safe and acceptable for the management of the radioactive waste materials generated as a part of the U.S. wartime effort in the forties and the fifties, and which have been constantly improved over the years, are not considered acceptable for long-term application to management of radioactive wastes."

Pittman, F.K., *Management of Commercial High-Level Radioactive Waste* 2 (paper presented at the Massachusetts Institute of Technology, July 25, 1972).

[8] An element's radioactivity is commonly measured in "curies". A "curie" is defined as "a unit quality of any radioactive nuclide in which 3.7 x 10^{10} disintegrations occur per second." *Webster's New Collegiate Dictionary* 279 (1973). There are approximately 11 million curies of radioactivity in the wastes produced by a single reactor's yearly operation. A common method of measuring the potential toxicity of a radioactive substance is by stating the amount of water required to dilute one curie to drinking water purity. One curie of Strontium-90, for instance, requires about ten billion gallons.

removed and concentrated from, spent reactor fuel. "Low-level" wastes consist principally of contaminated objects used in nuclear reactor technology (including actual plant structures). These contaminated objects exist in vastly greater quantities than do high-level wastes, but with more dilute radioactivity. Due to their extreme toxicity, high-level wastes have been the principle focus of management and disposal problems, although low-level wastes present difficult problems of substantial dimensions.[9] The

[9] Low-level wastes consist of a variety of reactor components and by-products contaminated with radioactive elements during the fission process. They include filters, filter sludge, spent ion exchange resins, protective clothing, solid trash, packing materials, obsolete equipment, shielding, piping, instrumentation, control rods and other nuclear reactor materials. These wastes are processed and packaged in quantities of small radioactivity and buried in shallow land disposal sites. We do not concede that the Commission adequately addressed the long-term problems of low-level waste disposal in this case. However, since the treatment of high-level waste disposal by the Commission was so egregious, a remand of the proceedings is compelled on that issue alone. The general issues of low-level waste management and disposal are merely outlined here.

The most serious problem confronted in the shallow burial of low-level wastes is the movement or migration of radioactive materials, most notably "transuranic elements", from burial sites. Transuranic elements are radioactive elements which are produced artificially in course of reactor operation, which, typically, have a higher atomic number and higher mass than uranium. Migration has occurred at virtually all commercial (and military) low-level waste disposal sites.

Although most scientific investigators have come to the conclusion that a known, distinct health hazard has not yet been produced by migration, the foreseeable difficulties of disposing of the predicted vast quantities of low-level waste produced by the increasing use of nuclear power reactors have caused a good deal of concern. The fear is that migration from less than suitable burial sites will create a public health hazard and require costly corrective measures if the migration is monitored and detected in a timely manner. Many of the existing sites for low-level waste disposal were chosen without adequate investigation, and the potential for harm over the necessarily long isolation period is real. The need for a reappraisal of present policies has been asserted by the Comptroller General of the United States, and an investigatory panel of

need to dispose of high-level wastes permanently is the most serious unresolved environmental impact of licensing nuclear power plants. Thus, the resolution of major

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the National Academy of Sciences (NAS). A 1976 report of the Comptroller General concluded:

> "Each of the existing disposal sites has different hydrogeological and other characteristics. Some appear more suitable than others for retaining radioactivity. It is not presently known what mix of hydrogeological characteristics and engineering features offers the greatest assurance that radioactivity, once buried, will not migrate to create a public health hazard and require extraordinary and costly efforts to correct.
>
> "Because (1) disposal sites must retain radioactivity for an extremely long time, (2) migration has already been detected at some sites, and (3) USGS and EPA earth scientists have questioned the adequacy of the studies made at some existing sites, a comprehensive study should be undertaken at both ERDA-owned and commercial sites. If the public is willing to accept the risk of land disposal of radioactive materials, it has a right to assurance that radioactivity will be disposed of only at sites which are expected to retain it and prevent it from becoming a public hazard. The public also has a right to expect at least a concensus among earth scientists that disposal sites are suitable." Comptroller General of the United States, *Improvements Needed in the Land Disposal of Radioactive Wastes—A Problem of Centuries* 17 (January 12, 1976), reprinted in *Hearings on Low-Level Radioactive Waste Disposal before a Subcommittee of the Committee on Government Operations*, 94th Cong., 2d Sess. 377 (1976).

The panel of the NAS which issued a report on the problems of land burial cited the principal environmental cost of increased low-level waste production, the irreversible land use commitment which will be necessary.

The NAS panel recommended that a permanent repository, similar to a permanent "high-level" waste repository, be found for any transuranic contaminated low-level wastes; and that future low-level burial sites be selected on the basis of more thorough investigation and testing for hydrogeological and other criteria than has characterized the recent past in order to assess suitability for the containment of radioactive materials prior to use. National Academy of Sciences/National Research Council, *The Shallow Land Burial of Low-Level Radioactivity Contaminated Solid Waste*, xv-xvii (1976).

The panel also noted that the difficulties of finding suitable low-level waste burial sites are enhanced by the need to dispose of major

environmental, economic and technical considerations associated with the licensing of nuclear power plants remains unknown and undemonstrated.

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components of nuclear reactors themselves after the end of their useful life (approximately 30-40 years). Reactor "disposal" or "decommissioning" is virtually untested; the only practical experience has come from the decommissioning of small research reactors. It is anticipated that commercial reactor structures will be left as long-term memorials of the nuclear power age, after being decontaminated or gutted of the most radioactive internal components. The economic costs of this decommissioning process are "predicted" to be small in comparison with the benefits of nuclear power, but the long-term environmental costs associated with the disposal of reactor parts as low-level wastes may be substantial. The NAS panel recommended that immediate attention be given to designing functional reactor components in a manner calculated to reduce the need for and the difficulty of waste disposal:

> "This Panel is seriously concerned with the land burial problem that will present itself with the dismantling of present commercial nuclear power reactors as they become obsolete and are replaced. We believe much more thought must be given to the design of the fabric or basic structure of the buildings housing future commercial power-generating reactors, in order that their useful life can be extended even though their internal operational parts are replaced.
>
> "In other words, the Panel believes that reactors and other nuclear facilities should be specifically designed so that the radioactive parts of the power plant or other functional parts of the system could be removed and replaced at the end of their useful life without having to destroy or abandon the shielding, building walls, and other portions of the total facility. In this way, the future need for the disposal of solid low-level radioactive waste may be substantially reduced. Safe dismantling of the present monolithic, nearly indestructible structures of contemporary commercial nuclear power-generating stations presents a most difficult task. The methods for separation of the radioactive fraction of the debris from these structures for disposal cannot be considered lightly. This problem includes the dismantling and decommissioning of commercial nuclear power reactors, as well as of other commercial and ERDA nuclear facilities. The problem has not been discussed or presented in the body of this report, but is a general concern of the Panel." *Id.* at xvi.

B. The *Vermont Yankee* Decision

The instant proceedings arise from a challenge to the Commission's failure to thoroughly and completely consider the environmental impact of radioactive wastes which would be produced by the operation of the Vermont Yankee Nuclear Power Plant in Veron, Vermont. By the way of an initial and renewed motion, and requests to submit interrogatories to the Commission's staff and to the Vermont Nuclear Power Corporation, the Natural Resources Defense Council, Inc. ("NRDC") and other intervenors sought to compel consideration of the environmental impacts of radioactive waste management and disposal by the Atomic Safety Licensing Board.[10] *App.* 410-484.

[10] Nuclear power plants are licensed in a bifurcated adjudicatory process. An applicant to construct a nuclear power reactor must obtain a construction permit from the Commission and prove that it will construct the facility in accordance with a design which will comply with generalized criteria included in the Commission's regulations. After constructing the facility, the applicant must then obtain an operating license which will be granted by the Commission only after definitive findings are made that the operation of the nuclear power plant will not be inimical to either the health and safety of the public or common defense and security. 42 U.S.C. § 2235. At the construction permit stage full adjudicatory hearings are mandatory, and at the operating license stage any member of the public whose interest may be affected has a right to intervene and request an adjudicatory hearing. 42 U.S.C. § 2239, 10 C.F.R. § 2.714. These hearings are conducted by specially constituted Atomic Safety and Licensing Boards ("ASLB") of three members, two of whom generally are professional scientists or engineers, and one is generally an attorney. 42 U.S.C. § 2241, 10 C.F.R. § 2.721. The decisions of ASLB may be appealed to a similarly constituted Atomic Licensing Appeal Board. 10 C.F.R. §§ 2.762, 2.785(a). The decision of an Appeal Board is subject to review by the Commission, but becomes a final agency action if review is not undertaken by the Commission within 20 days. 10 C.F.R. § 2.786.

Subsequent to the passage of the National Environmental Policy Act of 1969, the Commission's initial inclusion of environmental issues in the licensing process foreclosed discussion of environmental matters when the actual adjudicatory hearings were conducted. This policy of avoiding environmental concerns in the actual decision-

NRDC further requested that the Commission's staff prepare a detailed environmental statement which included a complete assessment of radioactive waste management and disposal. All such motions and requests were denied. *App.* 410-411, 485-487; *see also, App.* 488-519.

Pursuant to the Commission's regulations, 10 C.F.R. 2.730(f), NRDC's motion was submitted to and denied by Atomic Safety and Licensing Appeal Board ("Appeal Board") in an interlocutory decision. *In re Vermont Yankee Nuclear Power Corp.*, ALAB-56, 4 AEC 930 (1972). *App.* 520-21, 112-129. The Appeal Board concluded that the future reprocessing,[11] management or disposal of the radioactive materials produced by a nuclear reactor could be treated as distinct from the operation of the reactor itself for NEPA purposes. The Board stated that broader consideration of the environmental effects of radioactive wastes in individual licensing proceedings could "call a halt to the licensing of individual reactors" because "[n]o power reactor could be licensed until every present and future reprocessing plant was studied in some depth. . ." *App.* 123. Furthermore, the Board asserted that the environmental aspects of the ultimate disposal of high-level radioactive wastes produced in spent reactor fuel were remote and "speculative":

> "Evaluation of the environmental aspects of the ultimate depository of the high-level wastes resulting

making process was rejected succinctly as inconsistent with the procedural requirements of NEPA in *Calvert Cliff's Coordinating Committee* v. *AEC*, 449 F.2d 1109 (D.C. Cir. 1971).

[11] "Reprocessing" is a complex industrial technique for separating out reusable plutonium and/or uranium from spent reactor fuel and recycling it for reuse in conventional reactors. There are no commercial reprocessing plants presently operating in the United States. On April 7 and 25, 1977, President Carter announced the policy of his administration to defer indefinitely any plans or proposals to reprocess nuclear fuel on the basis of national security, environmental and economic reasons. *See*, 13 Pres. Doc. 560 *et seq.*, 566 *et seq.* (April 25, 1977).

from reprocessing is at this time speculative, because it has not yet been determined what the nature and the location of the ultimate depository will be. That project will also of course be subject to independent analysis and procedures in compliance with the Environmental Protection [sic] Act, and it cannot be the subject of appropriate evaluation in this proceeding." *App.* 126-127.

In the Appeal Board's opinion, delay in considering the environmental effects of radioactive wastes creates as a necessary by-product of licensing a nuclear power reactor would not be inconsistent with NEPA. It felt that more detailed and accurate analysis of these environmental factors could be made sometime in the future, when waste facilities were constructed and disposal sites chosen. *App.* 120.

C. The Notice of Proposed Rulemaking

Shortly after the interlocutory decision by the Appeal Board,[12] the Commission issued a notice of proposed rulemaking suggesting two possible approaches for the generic treatment of environmental issues associated with the entire nuclear fuel cycle, including radioactive wastes, in individual licensing proceedings. 37 *Fed. Reg.* 24191 (Nov. 15, 1972); *App.* 352-360. The first alternative proposed in the Commission's notice would adopt the decision of the *Vermont Yankee* Appeal Board as a formal regulation.[13] *App.* 356. The second alternative proposed by the Commission's notice would incorporate a table developed in a report prepared by the Commission entitled *Environmental Survey of the Nuclear Fuel Cycle* (Nov. 1972)

[12] The decision of the *Vermont Yankee* Appeal Board became a final administrative action of the Commission pursuant to 10 C.F.R. § 2.786.

[13] The regulation would require consideration only of the environmental effects of transporting radioactive wastes away from the actual power plant site itself. *App.* 356.

("Environmental Survey"), App. 538-646. This table, denoted "Table S-3", set forth a series of numerical values representing projected cumulative quantities of land, water, and fossil fuels which would be utilized in nuclear fuel cycle activities. The Table also provided values for the expected chemical and radiological effluents in gaseous, liquid and solid form and thermal effluents which would be released to the environment by the operation of all nuclear fuel cycle activities. The exact numbers presented in the Table combined the postulated operations of all fuel cycle activities together. These "normalized," imaginary "environmental costs" supposedly represent the incremental impact of an average size nuclear reactor burning an average supply of fuel over its operating lifetime. *App.* 356-358. No value was included to represent the environmental cost of long-term radioactive waste disposal.

The Commission's rulemaking notice reduces the detailed consideration which would be given to the environmental impacts of producing radioactive wastes to "certain" and allegedly "insignificant" numerical values. *App.* 356, 394-95. The Commission supported its approach with the following statement:

> *"Cost-benefit analyses of nuclear power reactor license applications should contain a full and frank disclosure and consideration of costs and benefits of the proposed action. The results of the application of this principle to the question of inclusion of environmental effects associated with the fuel cycle are not entirely clear.* As the above discussion indicates, the fractional contribution, if any, of the environmental effects of the fuel cycle to the cost-benefit balance for a particular nuclear reactor is difficult, and may be impossible, to ascertain with any degree of certainty. This suggests that such matters, if they are to be considered at all, be considered in a generic fashion through the rulemaking

process. The Commission's regulatory staff has prepared a report entitled "Environmental Survey of the Nuclear Fuel Cycle", dated November 6, 1972, which provides a basis for an informed consideration of the generic question of the environmental impact associated with the uranium fuel cycle in light water cooled nuclear power reactor license proceedings." *App.* 355 (emphasis added).

The reduction of acknowledged uncertainties of the development of waste management and disposal technologies to numerical results was based upon significant assumptions. It was presumed by the Commission in the "Environmental Survey" that: (1) all necessary technologies for handling radioactive wastes were sufficiently developed to implement a complete system resulting in ultimate disposal without further technical advances; see, *App.* 542, 579, 1201, 1242; (2) no future technological barriers would be encountered in the implementation of waste management and disposal systems which would affect environmental costs; *see*, *App.* 610-618; (3) human or technical accidents or failures would be of such limited likelihood that they need not be considered as relevant environmental costs; *see*, *App.* 570-576; 601-606; 623-24; (4) all technological systems would operate within theoretically calculated margins of environmental impact; *see* *App.* 545-550; and (5) the residual environmental impact of an average "model" system could substitute for a detailed discussion of the environmental effects of developing, demonstrating and commercializing different technological options which may be used to manage and dispose of nuclear wastes; *see*, *App.* 542-580.[14] These assumptions

[14] The Commission's entire analysis of the problems of radioactive waste management were premised upon the existence and environmental impacts of reprocessing plants. *See, e.g., App.* 580-609. A reprocessing plant, while recycling reusable nuclear fuel, would produce liquid and gaseous streams of remaining radioactive wastes. These waste quantities would then have to be solidified and stored, prior to ultimate disposal. Since the President has indefinitely deferred commercial reprocessing (*see* note 11, *supra*), the Commission's analysis of reprocessing is obsolete. Most significantly here, the Commission has relied upon the acceptability of long-term disposal of radioactive wastes from reprocessing. The alternative of simply disposing of spent fuel intact, commonly referred to as the "throwaway fuel cycle" has not been examined. Special considerations, requiring detailed technical investigation, exist relative to the disposal of intact spent fuel. For instance, study of the risks of chemical reactions between the metal cladding surrounding the fuel and possible disposal mediums, such as salt deposits (*see* pages *infra*), is necessary. Another significant problem would be the vastly increased concentration of plutonium in the wastes. These problems now deserve the detailed examination required by NEPA before additional nuclear power plant licenses are granted.

Reprocessing itself did not result in the rosy picture painted by the Commission in its rulemaking proceeding. The only reprocessing plant to operate in the United States, located at West Valley, New York, closed down for environmental modifications in 1972 and now has been permanently abandoned. The plant has been labelled a "technological and economic disaster" and a "misadventure that may end up costing the taxpayers of New York half a billion dollars, or a billion dollars, or even more. . ." in order to clean up the on-site high-level waste. Severo, *Too Hot to Handle*, New York Times Magazine, April 10, 1977. *See*, *App.* 1198-51.

alone lead the Commission to conclude that the technologies, industrial activities and environmental safeguards which will be implemented to protect the human environment from radioactive wastes are sufficiently predictable that future impacts can be conservatively estimated to be within the limits of a table of numerical values.

The only apparent basis for these critical assumptions concerning high-level radioactive waste disposal was the testimony of one witness, Dr. Frank K. Pittman.[15] Dr. Pittman discussed in some detail the *concept* of a temporary "Retrievable Surface Storage Facility" which theoretically could store radioactive waste cannisters until a permanent disposal site was found. On the issue of permanent disposal, Dr. Pittman merely concluded that the problem will be solved by virtue of,

[15] Dr. Pittman's testimony was not included in the actual "Environmental Survey" but was presented at the rulemaking hearing *App.* 776-799.

". . . the rather extensive program of research, development, testing, design, construction and pilot plant operation underway on the bedded salt concept, . . . [and] a thorough evaluation of all other potentially attractive near- and long-term disposal concepts in order to: (1) assure that no feasible concept has been overlooked; and (2) lay the groundwork for future programs, should the work on bedded salt not result in acceptability of that concept for very long-term disposal." *App.* 790-791.

No further detail on the costs and risks of the research program or on the likelihood and contingencies of its success or failure was provided by the Commission or its witness.

1. *Objections to the Nature of the Rulemaking Proceedings*

The objections made by UCS to the Commission's rulemaking proceeding were premised upon the total lack of any meaningful opportunity to inquire into the assumptions contained in the "Environmental Survey" and the Table S-3 rule.[16] Neither narrow option proposed by

[16] In conjunction with another party to the rulemaking proceedings, UCS filed a detailed legal critique of the procedural rights afforded by the Commission. *App.* 1035-57. The legal statement specifically requested that the Commission grant an opportunity for the use of adjudicatory procedures, including discovery and cross-examination, in the rulemaking hearing. The critical premise to these arguments was that UCS believed that it was impossible for the Commission to make a reasoned judgment of the issues given the limited framework for decision-making, the narrow choice of only two alternative rules and the nature and complexity of the factual and policy issues presented.

The use of adjudicatory procedures may well have alleviated some of these problems, and assisted in the development of a legally sufficient record. *See generally*, Hamilton, *Procedures for the Adoption of Rules of General Applicability: The Need for Procedural Innovation in Administrative Rulemaking*, 60 Calif. L. Rev. 1276 (1972); Clagett, *Informal Action—Adjudication—Rulemaking: Some Recent Developments in Federal Administrative Law*, 1971

the Commission as a means for incorporating the effects of fuel cycle activities into the environmental review accompanying reactor licensing decision provides any substantive analysis of problems and uncertainties in the present program of radioactive waste management. *See, App.* 1038-1043; 836-845. Most significantly, neither the proposed rule nor the underlying analysis in the "Environmental Survey" present a detailed evaluation of the multiple means being investigated as solutions to the high-level waste isolation problem, and the environmental costs of pursuing one or more of these techniques.

The Commission has simply ignored the actual experiences of government efforts to manage and to dispose of high-level radioactive wastes. Through written submissions and oral testimony, UCS articulated its concern on the record that there is no basis for the assumption that long-term waste isolation can be implemented at the present time. *App.* 1068-1107, 894-898. Rather than disclosing negligible numerical values to reflect to the Congress and the public the impact of producing radioactive wastes, UCS contended that the Commission should analyze and disclose the technical barriers which must be overcome prior to the implementation of a complete, adequate and environmentally acceptable system of controlling radioactive wastes. This would include an examination of the vast array of technologies which *may actually be implemented* to isolate radioactive wastes: varying methods of burial in stable geological structures, deep ocean burial, extra-terrestrial disposal, *et cetera. App.* 1084-1098. UCS seriously questioned the legitimacy of the goal of a proceeding which sought to define radioactive waste impacts as certain quantities, on the basis of theo-

Duke L.J. 51; Boyer, *Alternatives to Administrative Trial-Type Hearings for Resolving Complex Scientific, Economic and Social Issues*, 71 Mich. L. Rev. 111 (1972). However, since the Commission has totally failed to produce an adequate record, this Court need not reach these issues. *See* pages 46-47, *infra*.

retical calculations which ignored past problems and failures even to develop the technologies upon which the calculations were based. *App.* 837-838, 841-844, 894-898, 1072-1073.

The rulemaking hearing board reported a number of these concerns to the Commission. *App.* 364-378. The hearing board suggested a possible reexamination of the limitation of the proceedings to two alternative rules in light of the hearing record. *App.* 375-376. The hearing board also questioned whether a more extensive analysis of the long-term environmental effects of radioactive waste disposal was necessary, and would require a substantial revision of the "Environmental Survey." *App.* 372-73, 374. Finally, the hearing board proposed that the record may indicate that the methodology of basing environmental effects upon non-existant model facilities may not warrant the conclusion that the impact of producing radioactive wastes is negligible. *App.* 374.

2. *The Implementation of the Table S-3 Rule in the* Vermont Yankee *Case*

The Commission designated Table S-3 as its final rule, exclusively defining the environmental impacts of the nuclear fuel cycle. 39 *Fed Reg.* 14188 (April 22, 1974) (*App.* 385-400). The Commission made no meaningful response to the issues raised by UCS and reflected in the report of the hearing board. In its decision, the Commission acknowledges that Table S-3 and its underlying analysis in the "Environmental Survey" is neither a generic environmental impact statement filed pursuant to section 102(2)(c) of NEPA, nor ". . . an analysis of alternatives and costs and benefits of the entire uranium fuel cycle." *App.* 386. The sole purpose of the "Environmental Survey" was to serve as a "data base" for a rule implementing NEPA. *Id.* The salient conclusion of the rulemaking was that the actual problems of radioactive waste need not be fully considered as part of an environmental impact

statement prepared when nuclear power plants are licensed, because the risks posed by such wastes are "insignificant." *App.* 394-95. The Commission ruled that the environmental effects of radioactive waste would be considered in the future by simply incorporating the negligible values stated in Table S-3 into its licensing decisions.

In the final adjudication of the *Vermont Yankee* case, the Appeal Board cited the rulemaking proceeding as the final word on radioactive waste issues:

> "Whatever doubt there may have been concerning the correctness of the result reached in [the interlocutory decision] has been eliminated by the convening of [the uranium fuel cycle] rulemaking proceeding." *App.* 137.

Therefore, the Vermont Yankee Nuclear Power Plant was granted a license to operate and to produce radioactive wastes without any real consideration of the risks, costs and impacts of the necessary long-term management and isolation of those wastes. The Commission's refusal to consider these issues in the *Vermont Yankee* environmental impact statement is paralleled by the refusal, codifided in Table S-3, to permit any further inquiry into the environmental impacts of radioactive wastes beyond the limits set forth in the final rulemaking decision.[17] The final *Vermont Yankee* EIS simply states:

> "Long-lived radioactive materials will be produced by fission of nuclear fuel in the core of the reactor and neutron activation of reactor parts near the core. The eventual disposal and storage of radioactive materials will require a certain amount of space, probably in an area remote from this planet, for a very long period of time, and would for all practical purposes be considered as an irreversible commitment of resources." *App.* 536.

[17] 10 C.F.R. § 51.20(e) provides, ". . . No further discussion of such environmental effects shall be required." *App.* 398.

D. Proceedings Subsequent to the Decision Below

On July 21, 1976, a three-judge panel of the Court of Appeals for the District of Columbia determined that the Commission's exclusion of detailed consideration of the environmental impacts of radioactive wastes from nuclear power plant licensing review under NEPA was deficient both procedurally and substantively. *Natural Resources Defense Council* v. *NRC*, 547 F.2d 633 (D.C. Cir. 1976) *App.* 28-88. As Judge Tamm noted in his concurring opinion:

> "NEPA requires the Commission fully to assure itself that safe and adequate storage methods are technologically and economically feasible. It forbids reckless decisions to mortgage the future for the present glibly assuring critics that technological advancement can be counted upon to save us from the consequences of our decisions . . . . [*I*]*t is impossible to determine from the record before us whether the Commission has fulfilled its statutory obligation under NEPA in adopting the S-3 Table, in effect deciding that the incremental environmental effect of storing the waste of an additional nuclear reactor is negligible, or whether it has uncritically adopted as its own the undocumented conclusions of a single witness that the waste storage issue is a 'non-problem'* with which the Commission need hardly concern itself at this time." 547 F.2d at 658, *App.* 78-79 (emphasis added).

In response to the Court of Appeals decision, the Commission has developed an "interim" rule which is virtually identical to the Table S-3 rule in form and substance. 42 *Fed. Reg.* 13803 (March 14, 1977). The interim rule which has the effect of a final rule pending completion of reopened hearings, merely modifies Table S-3 slightly and includes a numerical value of 11 million curies per average reactor year to reflect the impact of long-term waste disposal.[18]

[18] The interim rule was based upon a revised survey of the previous analysis by the Commission's staff. *Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle*, NUREG-0116 (Supp. 1 to WASH.-1248) (Oct. 1976). No consideration was given in this survey to alternative means of disclosing the environmental effects of producing radioactive wastes aside from the publication of a revised table of numerical values in environmental impact statements. Minor changes in the values set forth in the original Table S-3 were made. The value of 11 million curies represents the high-level wastes buried at a "federal repository." *Id.*, "Table 2.10" at 2-33. The survey itself was admittedly not a complete environmental impact statement.

In conjunction with its interim rule, the Commission states that radioactive wastes will be "buried" at a federal repository," but acknowledges that a federal repository does not exist and that "uncertainties" are present "[w]ith respect to risks from long term repository failure." 41 *Fed. Reg.* 45849, 45850-51 (Oct. 18, 1976). These uncertainties are explained away because, ". . . [i]n areas where information necessary for a complete quantitative assessment of environmental impacts is lacking . . . Federal programs are underway to resolve existing uncertainties." *Id.* A two-page summary of the plans of the Energy Research and Development Administration to locate and to demonstrate a feasible high-level radioactive waste repository for long-term disposal is included as an appendix to a supplement to the revised "Environmental Survey."[19] No further information is provided concerning the costs and risks perceived necessary for the successful development and implementation of the technology to dispose of radioactive wastes permanently.

The critical assumption that radioactive wastes will be isolated permanently from the human environment by technological advancement has not been probed further by the Commission. As one member of the Atomic Safety and Licensing Appeal Board recently asserted:

> "[There is] some question about the nature of the consequences that we should assume might flow from the existance of the high level radioactivity postulated by the [revised] Table.

[19] *Id.* at Appendix B-1-3.

> "I have now come to the conclusion that, regardless of any uncertainty it perceives on the matter, the Commission intends those charged with applying Table S-3 to assume that the eleven million curies of waste generated in each year of a typical reactor's operation remain in place in the postulated repository and do no damage whatsover . . .
>
> "[A]lthough the Commission referred to uncertainties concerning waste repository failure in proposing the interim rule, it indicated when it adopted the rule that it meant us to discount these uncertainties entirely . . . .
>
> "The only way to conclude that there is no substantial difference between (1) not mentioning high level wastes at all and (2) representing it in terms of eleven million curies per average reactor per year, is to assume that the waste remains in place permanently and presents no threat at all to human safety of the environment."

Vermont Yankee Nuclear Power Corp. and Public Service Company of New Hampshire, et al., ALAB-421, —— NRC —— (July 18, 1977) (concurring opinion of Mr. Farrar).

SUMMARY OF ARGUMENT

The Commission must consider the environmental effects of producing radioactive waste by-products from nuclear power plants during the licensing process. Just as it would be illogical and illegal to fail to consider the production of air pollutants by a coal-fired power plant, it is inconsistent with NEPA to ignore the fact that nuclear power plants produce toxic radioactive materials which present a grave, long-term risk to the human environment. The need to manage and dispose of radioactive wastes is a direct and substantial environmental impact caused by the operation of a nuclear power plant, which bears significantly on the choice between the nuclear

option and its alternatives. It therefore deserves the most "searching scrutiny" before irreversible commitments are made without a full, current understanding of the costs and risks involved.

The Commission's rulemaking proceeding, while acknowledging that the production of radioactive wastes is a component of the nuclear licensing decision, was not based upon a consideration of relevant factors and did not constitute a reasoned exercise of administrative decision-making. The Commission failed to make any showing, based upon evidence, scientific data or proposed technology development programs, to support its conclusion that the serious environmental problems posed by the production of radioactive wastes are "relatively insignificant."

The Court of Appeals found that the factual basis and reasoning supporting the rule allegedly designed to implement NEPA was deficient. The Court did not declare the rulemaking procedures illegal, but correctly found that the rulemaking decision was based solely on the inadequate and conclusory assurances of one witness, Dr. Frank K. Pittman. Dr. Pittman's testimony was not only inadequate because it was unacceptably vague and general, but also insufficient to support the Commission's rule because it did not even deal with the most significant environmental impact, the need to develop methods for permanent radioactive waste disposal. When faced with substantial criticism of Dr. Pittman's presentation, the Commission did not give a reasoned explanation of its final decision or its basis for ignoring the opinions of other qualified scientists and the history of our failure to achieve projected waste disposal goals.

The only explanation offered by the Commission to support its limited consideration and disclosure of the risks and costs necessitated in order to control radioactive wastes was an assertion that the Commission did not real-

ly intend to analyze the environmental effects in detail. The Commission candidly admits, after the fact, that the purpose of the rulemaking was only to develop a "data base" for deriving numerical predictions of environmental end results, after *postulated technologies* were applied to manage radioactive wastes. Neither facts nor reasoning can be found in the record to provide a rational basis for the approach or conclusions of the Commission.

The Commission sweeps under the rug known environmental problems associated with radioactive waste disposal by applying the mystique of technical expertise. It unacceptably attempts to implement NEPA by crystal ball prophecy, rather than through full disclosure of present environmental risks and costs. The result reached in the Commission's rulemaking reduces environmental concerns beyond rational comprehension. Only a table of "relatively insignificant" numbers is proposed to inform Congress, the public, other federal agencies and others removed from the decision-making process what the implications of producing radioactive wastes are. Therefore, until the Commission implements a means whereby the environmental effects of radioactive wastes can be given full consideration, rather than reduction of hypothetical numerical values, the congressional mandate of NEPA has not been met.

ARGUMENT

I. THE NATIONAL ENVIRONMENTAL POLICY ACT REQUIRES THAT THE COMMISSION GIVE DETAILED CONSIDERATION TO THE PRODUCTION OF RADIOACTIVE WASTES BEFORE IT DECIDES TO GRANT NUCLEAR POWER PLANT LICENSES

A. Consideration of Environmental Issues in Nuclear Plant Licensing

The licensing of the Vermont Yankee Nuclear Power Plant is admittedly a "major federal action . . . significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(c). When determining whether to grant nuclear power plant licenses, the Commission regularly prepares an "environmental impact statement" ("EIS") pursuant to section 102(2)(c) of the National Environmental Policy Act of 1969, 42 U.S.C. § 4331 *et seq.*, ("NEPA").

The EIS evaluates in detail the environmental effects of the proposed nuclear plant and reasonable alternatives which could be implemented to satisfy or to reduce the need for energy. This detailed statement compares the need for and alleged benefits of the proposed nuclear power plant, the costs and benefits of various designs and sites for the nuclear facility, and the environmental consequences of various nuclear proposals and non-nuclear alternatives. The EIS becomes part of the administrative record, and is subject to the adjudicatory process of decision-making before Atomic Safety and Licensing Boards, Atomic Safety and Licensing Appeal Boards, and the Commission itself. *See, Calvert Cliffs Coordinating Committee* v. *AEC*, 449 F.2d 1109 (D.C. Cir. 1971).

In the *Vermont Yankee* EIS, the Commission has included an extensive discussion of environmental issues relevant to the operation and siting of the nuclear power plant. That discussion is generally consistent with the broad policy objectives of NEPA. The effects of the plant upon surrounding lands, the impact of complex cooling systems upon aquatic life, the radiological releases into the local environment and numerous other issues relating to the normal operation of a nuclear power plant are studied and examined rather thoroughly in comparison to the impacts of reasonable alternatives. Following its normal methodology, the Commission has balanced the costs and risks of various options analyzed in the EIS from an environmental point of view against economic and technical factors. *Cf., Citizens for Safe Power* v. *NRC*, 524 F.2d 1291, 1298-1301 (D.C. Cir.

1975). However, also following its usual practice, the Commission has largely ignored the production of nuclear wastes as an environmental consequence of licensing the nuclear power plant itself.

B. The Production of Radioactive Wastes is an Inevitable and Substantial Environmental Impact of Licensing a Nuclear Power Plant

Unlike a coal-fired power plant, or any other means of generating electricity or producing energy, a nuclear power plant inevitably causes substantial and significant long-term environmental consequences by producing radioactive wastes. Those consequences are so serious that they require an unprecedented need for human care and vigilence. An "environmental impact" of licensing nuclear power plants is clearly the production of radioactive wastes and the dangers created by their presence in the environment. 42 U.S.C. § 4332(2) (C) (i).

Each licensing of a nuclear power plant commits the nation to finding a means of isolating its wastes from the human environment for hundreds of thousands of years in order to prevent irreversible injury to the environment and human beings. Once a series of nuclear power plants are licensed, the nation inevitably has committed itself to major technological research, development, and implementation of programs to develop means of dealing with the cumulative inventory of radioactive wastes. Thus, the environmental impact of licensing nuclear power plants inextricably includes the efforts necesary to adequately manage and isolate radioactive wastes, and the costs and consequences of the failure or success of those efforts.[20]

[20] It is admittedly within the discretion of the Commission to evaluate the environmental effects of radioactive wastes on the public record in generic or in individual licensing proceedings. 547 F.2d at 641 and n. 17; *App.* 38-40 and n. 17. As the Court of Appeals noted, the imperative obligation of NEPA is for the Commission "to break the cycle of . . . incremental decision-making." *Id.* at 640; *App.* 38. The *Vermont Yankee* Appeal Board's decision would perpetuate non-compliance with NEPA's mandate solely on the premise that procrastination may produce a more "detailed" statement. But, procrastination of basic NEPA responsibilities would actually ignore critical environmental issues which should be disclosed to the public and Congress forthwith:

> "The real question posed by the Board's opinion is whether the environmental effects of the wastes produced by a nuclear reactor may be ignored in deciding whether to build it because they will later be considered when a plant is proposed to deal with them. To answer this question any way but in the negative would be to misconstrue the fundamental purpose of NEPA. Once a series of reactors is operating, it is too late to consider whether the wastes they generate should have been produced, no matter how costly and impractical reprocessing and waste disposal turn out to be; all that remains are engineering details to make the best of the situation which has been created." 547 F.2d at 640; *App.* 37-38 (footnotes omitted).

Furthermore, NEPA's "action-forcing" disclosure requirements were passed by Congress for the purpose of continually reviewing past determinations and programs and their alternatives from an environmental viewpoint. *See, e.g., NRDC* v. *Morton*, 458 F.2d 827, 833-34, 836 (D.C. Cir. 1972). The Commission's past licensing actions are by no means a bar to considering the problem of radioactive waste disposal as soon as possible. Other more environmentally benign energy alternatives may be foreclosed in the future by the unexamined costs of controlling more and more radioactive waste. *Cf., Scientists Institute for Public Information* v. *AEC*, 481 F.2d 1079, 1089-90 (D.C. Cir. 1973).

Despite a public acknowledgement that radioactive wastes ". . . pose the most severe potential health hazard and the most complex technical problems in management . . .," [21] the Commission has failed to disclose in its *Vermont Yankee* EIS the commitments which will be necessary, the health hazards which must be endured, and the problems which must be overcome. The failure to discuss these facts in an environmental assessment violates the principal mandate of NEPA:

[21] Fox, *Radioactive Wastes*, AEC No. IB-508 at 12 (rev. ed. 1969). (This publication was issued by the Commission as a public information handbook).

"[W]hat is required is information sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned." *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972).

C. The Plain Language of NEPA and its Legislative History Establish a Duty to Consider Fully the Environmental Implications of Producing Radioactive Wastes

The central legal inadequacy of the Commission's minimal disclosure of the hazards and consequences of radioactive waste production is the lack of any discussion of environmental problems in terms of the qualities specifically designated in NEPA. These problems are a paradigm of those meriting disclosure under section 102(2)(c) of NEPA: the impact of the action is the actual creation of radioactive waste and its accompanying hazards (42 U.S.C. § 4332(C)(i)); an irreversible commitment of resources to the development of means to manage and dispose of the wastes is required (42 U.S.C. § 4332(2)(C), (iv)); risks that accidents, technical or human failures will cause irreversible environmental contamination are created (42 U.S.C. § 4332(2)(C)(ii), (iv)); and a predetermined preference for sacrificing an amount of long-term productivity in exchange for short-term benefits is made (42 U.S.C. § 4332(2)(C)(v)). As Senator Jackson, one of the principal sponsors of NEPA, emphasized, treatment of environmental factors in these terms is essential to justify major federal actions:

> "Subsection 102(c) [enacted as 102(2)(c), 42 U.S.C. § 4332(2)(C)] establishes a procedure designed to insure that in instances where a proposed major Federal action would have a significant impact on the environment that the impact has in fact been considered, that any adverse effects which cannot be avoided are justified by some other consideration of national policy, that short-term uses are consistent with long-term productivity, and that irreversible and irretrievable commitments of resources are warranted." 115 Cong. Rec. 29055 (Oct. 8, 1969).

The legislative history of section 102(2)(c) of NEPA, the so-called "action-forcing" provision of the law, clearly establishes the policy objective of directly incorporating relevant environmental issues into the process of agency decisionmaking:

> ". . . [T]o make policy effective through action, a comprehensive system is required for the assembly and reporting of relevant knowledge; and for placing before the President, the Congress and the people, for public decision, the alternative courses of action that this knowledge suggests."

L. Caldwell, *A Special Report to the Senate Committee on Interior and Insular Affairs: A National Policy for the Environment*, 10-11, 90th Cong., 2d Sess. (Committee print July 11, 1968), *reported at* 115 Cong. Rec. 12126, 12129 (Oct. 8, 1969); *see generally*, S. Rep. No. 91-296, 91st Cong., 1st Sess. (1969).

The Commission's actions reduce consideration of the environmental impact of producing radioactive wastes to ludicrous proportions. The *Vermont Yankee* EIS contains a simple statement concluding that the wastes will be isolated sometime, somewhere and somehow in a safe manner. *App.* 533. The "Table S-3" rulemaking proceedings conclude that this "Alice in Wonderland" statement of the environmental impact need not be expanded because the problems of radioactive waste disposal are "relatively insignificant". *App.* 393-94. No attempt is made to describe environmental risks which must be endured, or resource commitments which will be required to turn the present reality of unresolved environmental protection problems into a future of insignificant and negligible effects. The exclusive focus of the Commission is a pre-

diction that, in the end, technologies will be implemented to reduce adverse consequences to impacts which can be disclosed in terms of conclusory "numerical values".

The legislative history and express language of section 102(2)(c) of NEPA forbids this type of approach. *See generally*, S. Rep. No. 91-296, 91st Cong. 1st Sess. (1969). Even if the Commission's judgment about the application of future technologies was unequivocally correct, the duty set forth in NEPA is the disclosure of costs, risks, and other factors relevant to the attainment of projected environmental protection goals. The Commission has concluded merely what those goals are, rather than providing information sufficient to allow others to determine whether the process of attaining environmental protection from radioactive wastes may be too great or too risky in comparison to alternatives to a nuclear power plant. The purpose of the section 102(2)(c) impact statement is to fulfill this latter objective:

> "[T]he requirement of a detailed statement helps insure the integrity of the process of decision by precluding stubborn problems or serious criticisms from being swept under the rug. A conclusory statement 'unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind' not only fails to crystallize issues, *Natural Resources Defense Council* v. *Grant*, 355 F.Supp. 280, 287 (E.D. N.C. 1973), but 'affords no basis for a comparison of the problems involved with the proposed project and the difficulties involved in the alternatives.' *Monroe County Conservation Council* v. *Volpe*, 472 F.2d 693, 697 (2d Cir. 1972)."

Silva v. *Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973); *see also*, *Environmental Defense Fund* v. *Corps of Engineers*, 492 F.2d 1123, 1133-37 (5th Cir. 1974); *Sierra Club* v. *Froehlke*, 486 F.2d 946, 950-51 (7th Cir. 1973); *Environmental Defense Fund* v. *Corps of Engineers*, 470 F.2d 289, 295-96 (8th Cir. 1972), *cert. denied*, 412 U.S. 931 (1973); *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 833-34, 836-38 (D.C. Cir. 1972); *Calvert Cliffs Coordinating Committee* v. *AEC*, 449 F.2d 1109, 1112-15 (D.C. Cir. 1971).

As this Court has made clear in *Kleppe* v. *Sierra Club*, 427 U.S. 390 (1976), an agency must disclose the present reality of environmental consequences of existing proposals. The hoped-for end-results of future proposals do not provide the information necessary for a choice between alternative courses of action on the basis of current environmental knowledge and circumstances. Here, the nuclear licensing proposal dictates substantial future risks and costs. The *unavoidable adverse consequences* of the nuclear power plant licensing proposal include the further actions compelled in order to protect the human environment from the radiological hazard of its wastes. The controversies surrounding the development of methods of achieving this goal, and the Commission's evaluation of the process of resolving the environmental hazard created must be presented explicitly in a record compiled pursuant to NEPA.

D. Environmental Factors Must be Considered Contemporaneously with Causative Proposals for Action

The decision of the Court of Appeals below affirms the principle that an agency ". . . make reasonable forecasts of the future [and] predict the environmental consequences of its decisions as it makes them." 547 F.2d at 639-40; *App.* 36-37. *See, Kleppe* v. *Sierra Club*, 427 U.S. 390, 401-02, 409 (1976) (*"Kleppe"*); *Aberdeen & Rockfish Railroad Co.* v. *SCRAP*, 422 U.S. 289, 320 (1975) (*"SCRAP"*). This principle is premised upon the fundamental policy goal of NEPA to provide timely information concerning environmental factors so that agency decision-making is fully informed. Without adequate in-

formation, neither Congress, interested agencies, state governments, nor the public can intelligently weigh environmental problems against other goals. Agency decisions which arguably should be reversed or revised before irreversible actions are taken will be left intact. *See, e.g.*, *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 833 (D.C. Cir. 1972); *Calvert Cliffs' Coordinating Committee* v. *AEC*, 449 F.2d 1109, 1113-15 (D.C. Cir. 1971).

The relegation of environmental problems to future review was considered expressly inconsistent with the legislative purposes of the Act:

> "Policy is established by default and inaction. Environmental problems are only dealt with when they reach crisis proportions. Public desires and aspirations are seldom consulted. Important decisions concerning the use and shape of man's future environment continue to be made in small but steady increments which perpetuate rather than avoid the recognized mistakes of previous decades."

S. Rep. No. 91-296, 91st Cong., 1st Sess. 5 (1969).

The Commission's primary rationalization for not providing a detailed statement of the environmental problems of isolating radioactive wastes in the *Vermont Yankee* case conflicts with this policy. The Commission argues that radioactive waste problems are "remote" and "speculative" at the time a power plant is licensed. The Commission therefore believes that it would be "more appropriate" to analyze the problems when actual waste management and disposal technologies are implemented. *App.* 119-120, 394, 397. The Petitioner, in support of the Commission's determinations, relies upon the holdings in *Kleppe* and *SCRAP* which have interpreted section 102 (2) (c) of NEPA not to require a detailed examination of environmental problems caused by actions removed from a present proposal by time or location.

This reliance is misplaced. The relationship between radioactive waste production and nuclear power plant licensing does not involve a distinction between present proposals and actions merely "contemplated" or separately planned. Rather, the issue presented here concerns the quality of disclosure required by NEPA for a particular set of environmental consequences of the licensing decision. The separation of the environmental risks of producing radioactive wastes from licensing decisions on the basis of a distinction between immediate *actions* and long-term *impacts* would draw an "arbitrary and capricious" boundary foreclosing timely assessment of the environmental factors. Environmental costs and risks arise from producing the radioactive wastes in the first place, not some time later, when an irreversible commitment has already been made.

The critical standard applicable to this case, which establishes when specific environmental issues must be considered under NEPA, is causation. When known proposals for action of concrete dimensions cause specific environmental consequences, those consequences must be given detailed consideration in comparison to the consequences of alternatives. If consideration of environmental factors is delayed until some time after causative federal actions have been approved, the "hard look" at environmental consequences will not be taken until it is too late to "assess" and to "weigh" in individual cases "the particular economic and technical benefits . . . against the environmental costs." *Calvert Cliffs Coordinating Committee* v. *AEC*, 449 F.2d 1109, 1123 (D.C. Cir. 1971). Furthermore, environmental consequences will be created despite subsequent remedial actions, and despite the existence of foregone alternatives which could have "alleviated a significant portion of environmental harm" and provided options to foreclose environmental problems "while they are still of manageable proportions." *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 836

(D.C. Cir. 1972); *see*, S. Rep. No. 91-296, 91st Cong., 1st Sess. 5, 12-13 (1969).

The President's Council on Environmental Quality ("CEQ"), which was specifically designated by Title II of NEPA (42 U.S.C. § 4341 *et. seq.*) to develop guidelines for other agencies in the implementation of section 102(2)(c), has reiterated the importance of recognizing long-term consequences of immediate actions in impact statements. First, the CEQ has concluded that the secondary effects of proposals, occurring at a later date, may be very substantial from an environmental point of view:

> ". . . [s]econdary effects, . . . through inducing new facilities and activities, or through changes in natural conditions, may often be even more substantial than the primary effects of the original action itself."

40 C.F.R. § 1500.8(a)(3)(ii). The production of radioactive wastes by virtue of licensing a nuclear power plant is a clear example of such a substantial "secondary" impact. Second, the CEQ has concluded that the interrelated or cumulative environmental impacts of proposed federal actions should be disclosed where there is a significant environmental relationship:

> "The interrelationship and cumulative environmental impacts of the proposed action and other related Federal projects shall be presented in the statement."

40 C.F.R. § 1500.8(a)(i).

As this Court has noted, the procedural obligations of NEPA depend upon the kind of federal action being taken. *SCRAP*, *supra*, 422 U.S. at 322. Here, the immediate proposal, the licensing of one nuclear power plant, actually *creates* a "secondary" environmental problem of coping with its wastes, and absolutely necessitates future *remedial* actions. Unlike the circumstances presented in *Kleppe*, there is no evidentiary issue raised here concerning the existence or scope of a presently planned proposal for action. Unlike highway segmentation cases, or situations where distinct federal actions may have a "joint" or "synergistic" environmental impact, the production of radioactive wastes does not raise an evidentiary question concerning the *independence* of a present proposal for action from the environmental consequences of related actions which are merely contemplated or separated by geographic location.[22] Therefore, the Commission must, "[w]ith appropriate allowances for the inexactness of predictive ventures . . .," describe and analyze the long-term environmental consequences of producing radioactive wastes. *Kleppe*, *supra*, 427 U.S. at 402, n.13.

Both the *Vermont Yankee* Appeal Board, and subsequently the Commission, have acknowledged that serious uncertainties characterize the future environmental management of radioactive wastes. *App.* 126-27, 354-55. The Commission's attempt to evade its NEPA responsibilities on the basis of a claim that environmental consequences are uncertain, if upheld by this Court, would subvert the purposes of the Act. Where a proposal may have severe

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[22] A line of Court of Appeals decisions has also focused upon the distinction between present proposals and other independent actions. *See, e.g., Swain* v. *Brinegar*, 542 F.2d 364 (7th Cir. 1976); *Swain* v. *Brinegar*, 517 F.2d 766 (7th Cir. 1975); *Conservation Society of Southern Vermont* v. *Secretary of Transportation*, 531 F.2d 637 (2d Cir. 1976); *Trout Unlimited* v. *Morton*, 509 F.2d 1276 (9th Cir. 1974); *Scientists Institute for Public Information* v. *AEC*, 481 F.2d 1079, 1093-94 (D.C. Cir. 1973) ["*SIPI*"]; *but see also*, *Sierra Club* v. *Froehlke*, 534 F.2d 1289 (8th Cir. 1976); *Natural Resources Defense Council* v. *Callaway*, 524 F.2d 79 (2d. Cir. 1975); *Natural Resources Defense Council* v. *EPA*, 512 F.2d 1351 (D.C. Cir. 1975); *Minnesota PIRG* v. *Butz*, 498 F.2d 1314 (8th Cir. 1974). None of these cases presented factual circumstances similar to those here because there is no doubt that the scope of the nuclear licensing proposal includes the production of radioactive wastes. There is no independent act or segmented proposal which will create the environmental impact of having to cope with radioactive wastes. The Commission should, perhaps, treat the problem of radioactive wastes generically, due to the cumulative aspects of the long-term management and disposal problems. This determination is not before the Court, and in fact the Commission has chosen to handle the issues generically.

long-range effects, these effects can not be ignored merely because they are of uncertain dimensions. There is no question that the production of radioactive wastes poses a serious known risk of harm to the human environment of unprecedented dimensions. The only uncertainty is whether the wastes can and will be controlled in order to minimize potential adverse consequences at an acceptable economical cost for the thousands of years during which they will remain toxic.

The Commission need not engage in a "crystal ball inquiry." But it must comply with the congressional policy embodied in NEPA which does not permit agencies to commit the nation incrementally to presently unresolved environmental problems, without disclosing the nature of the risks and the costs which will be involved in their resolution. As the Court of Appeals found, the Commission's speculation as to theoretically calculated environmental end results rests solely upon ". . . a blind faith in technological progress." 547 F.2d at 640 n.13; *App.* 37 n.13. NEPA does not allow that course of action. The Commission has an obligation to explore the uncertainties and lack of resolution of environmental problems:

> ". . . Section 102(c)'s [sic] requirement that the agency describe the anticipated environmental effects of proposed action is subject to a rule of reason. The agency need not foresee the unforseeable, but by the same token neither can it avoid drafting an impact statement simply because describing the environmental effects of and alternatives to particular agency action involves some degree of forecasting. And one of the functions of the NEPA statement is to indicate the extent to which environmental effects are essentially unknown. It must be remembered that the basic thrust of an agency's responsibilities under NEPA is to predict the environmental effects of proposed action before the action is taken and those effects fully known . . . [I]mplicit in [the] rule of reason

> is the overriding statutory duty of compliance with impact statement procedures to 'the fullest extent possible.'"

Scientists Institute for Public Information v. *AEC*, 481 F.2d 1079, 1097 (D.C. Cir. 1973) (footnote omitted).[23]

As this Court affirmed in *Kleppe*, environmental statements should be predicated upon some factual base which "could be the subject of the analysis envisioned by the statute for an impact statement." *Kleppe*, *supra* at 401. Here, where the means to achieve projected results will have a substantial economic cost in technology research and implementation and will involve serious risks of harm to the human environment, these facts should be reasonably set forth on the public record. The mandate of the law is quite simple: once an agency undertakes a "proposal for action", it must provide a detailed evaluation of its environmental consequences on the basis of the best information presently available. Disclosure of environmental problems by the Commission after they have been created by its earlier licensing decisions violates

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[23] Also in *SIPI*, the Court of Appeals noted that in certain instances,

> "[B]y the time commercial feasibility of the technology is conclusively demonstrated, and the effects of application of the technology certain, the purposes of NEPA will already have been thwarted. Substantial investments will have been made in the development of the technology and options will have been precluded without consideration of environmental factors. Any statement prepared at such a late date will no doubt be thorough, detailed and accurate, but it will be of little help in ensuring that decisions reflect environmental concerns." 481 F.2d at 1093-94.

UCS submits that deferral of a thorough analysis of the environmental effects of radioactive wastes until disposal technology may or may not be commercially demonstrated would pose the precise problem resolved in *SIPI*. It is the cost of reaching a "conclusive demonstration" of waste disposal technology and the risk that substantial investments will not alleviate environmental problems that deserve the most searching scrutiny.

its duty to avoid ". . . locking the barn door after the horses are stolen." *Lathan* v. *Volpe*, 350 F. Supp. 262, 266 (W.D. Wash. 1972).

II. THE TABLE S-3 RULEMAKING RECORD IS INSUFFICIENT TO COMPLY WITH THE COMMISSION'S LEGAL OBLIGATION TO CONSIDER ALL RELEVANT FACTS CONCERNING RADIOACTIVE WASTE DISPOSAL AND TO STATE A REASONED BASIS FOR ITS CONCLUSIONS

A. Judicial Review of Rulemaking Under NEPA

As a substitute for formally considering the environmental effects of producing radioactive wastes in the *Vermont Yankee* EIS, the Commission analyzed these issues for one and one-half days in the Table S-3 rulemaking proceedings. *App.* 352-400, 538-1339. The Commission acknowledges that its consideration of the environmental effects of radioactive waste production in a rulemaking proceeding pursuant to section 4 of the Administrative Procedure Act ("APA"), 5 U.S.C. § 553 (c), was a suggested "means" of fulfilling its obligations under section 102(2) (c) of NEPA, *App.* 387. By instituting these proceedings, the Commission implicitly admits that radioactive wastes are in fact an important environmental impact of licensing a nuclear power plant. However, the Commission concludes in the rulemaking that the problems of radioactive waste management and disposal are so insignificant that they need not be disclosed to the public pursuant to the requirements of NEPA. *App.* 394-95. According to the Commission, a "full and frank disclosure" of the environmental impact of producing radioactive wastes could be achieved by the inclusion of Table S-3's negligible numerical values in future impact statements.

The plain words of Section 4 of the APA, 5 U.S.C. § 553(c), require an agency to give notice of its proposed actions, to provide an opportunity for interested parties to participate, and to incorporate into adopted rules ". . . a concise general statement of their basis and purpose." 5 U.S.C. § 553(c). The House report clarifies the purpose of the "basis and purpose" section of the Act:

> "The agency must keep a record and analyze and consider all relevant matters presented prior to the issuance of rules. The required statement of the basis and purpose of rules issued should not only relate to the data so presented but with reasonable fullness explain the actual basis and objectives of the rule."

H.R. Rep. No. 1980, 79th Cong., 2d Sess. 25 (1946). This Court has determined that agency actions are "arbitrary and capricious" or "otherwise not in accordance with law" under section 10(e) of the Administrative Procedure Act, 5 U.S.C. § 706(2) (A), when the agency's record does not consider all relevant factors and does not set forth a reasoned basis for the conclusions reached which is consistent with statutory law. *See, e.g., FPC* v. *Transcontinental Pipe Line Corp.*, 423 U.S. 326 (1976); *Bowman Transportation, Inc.* v. *Arkansas-Best Freight System, Inc.*, 419 U.S. 281 (1974); *Gulf States Utilities Co.* v. *FPC*, 411 U.S. 747 (1973); *Camp* v. *Pitts*, 411 U.S. 138 (1973); *Citizens to Preserve Overton Park* v. *Volpe*, 401 U.S. 402 (1971); *SEC* v. *Chenery Corp.*, 332 U.S. 194 (1947); *SEC* v. *Chenery Corp.*, 318 U.S. 80 (1943).

The "innovative" use of rulemaking by the Commission to comply with NEPA presents this Court with an issue of first impression. This is the first instance where a federal agency has used a rulemaking proceeding to limit the quality of disclosure of the environmental consequences of its actions. In defining the quality of environmental disclosure necessary, the requirements of NEPA

are similar to the "basis and purpose" section of the Administrative Procedure Act. A reviewing court must insure that an agency reasonably considers the environmental consequences of its actions by means of a good-faith, objective effort, sufficient to disclose relevant environmental problems to decision-makers removed from the precise weighing of the costs and benefits of proposals. *See, e.g., Sierra Club* v. *Morton*, 510 F.2d 813, 819-20 (5th Cir. 1975); *Sierra Club* v. *Froehlke*, 486 F.2d 946, 950-51 (7th Cir. 1973); *Silva* v. *Lynn*, 482 F.2d 1282, 1284-85 (1st Cir. 1973); *Environmental Defense Fund* v. *Corps of Engineers*, 470 F.2d 289, 295-96 (8th Cir. 1972), *cert. denied*, 412 U.S 931 (1973); *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 833, 836-38 (D.C. Cir. 1972). The overriding purpose of the Act is the development of a record analyzing environmental risks and costs and incorporating environmental factors into agency decisions "to the fullest extent possible." 42 U.S.C. § 4332; *see, Calvert Cliffs' Coordinating Committee* v. *AEC*, 449 F.2d 1109, 1113-15, 1118-19 (D.C. Cir. 1971); *see generally*, S. Rep. No. 91-296, 91st Cong., 1st Sess. 1969).

Accordingly, while the Court must not "substitute its judgment for that of the agency" in reviewing the Commission's record of decision-making, the "inquiry into the facts is to be searching and careful." *Citizens to Preserve Overton Park* v. *Volpe*, 401 U.S. 402, 416 (1971). Where the comprehensiveness of disclosure under NEPA is drastically limited by the development of a rule, as is the case here, the record supporting the validity of the rule should be thorough and complete. Implicit in NEPA is a duty to explain why relevant information brought to the attention of an agency by interested parties will not be examined as part of major federal actions. *See, e.g., Committee for Nuclear Responsibility* v. *Seaborg*, 463 F.2d 783, 787-88 (D.C. Cir. 1971). Failure to analyze major issues would defeat

NEPA's goals of achieving "environmental full disclosure" and making "decision-making more responsive and more responsible." *Environmental Defense Fund* v. *Corps of Engineers*, 325 F. Supp. 749, 759 (E.D. Ark. 1971).

NEPA does not permit the Commission to sit back and passively judge adversary contentions. The Commission must "explicate fully its course of inquiry, its analysis and its reasoning." *Ely* v. *Velde*, 451 F.2d 1130, 1139 (4th Cir. 1971). "The role for the court is to insure that the agency has taken a 'hard look' at environmental consequences." The pragmatic process of judicial review of a record supporting environmental decision-making has been clearly summarized by Judge Leventhal:

> "[T]he court must study the record attentively, even the evidence on technical and specialist matters, 'to penetrate to the underlying decisions of the agency, to satisfy itself that the agency has exercised a reasoned discretion with reasons that do not deviate from or ignore the ascertainable legislative intent.' It must ensure that the agency 'has given reasoned discretion to all material facts and issues.' The court exercises this aspect of its supervisory role with particular vigilance if it 'becomes aware, especially from a combination of danger signals that the agency has not really taken a *'hard look'* at the salient problems, and has not genuinely engaged in reasoned decision-making."

Leventhal, *Environmental Decision-making and the Role of the Courts*, 122 U. Pa. L. Rev. 509, 511 (1974), quoting *Greater Boston Television Corp.* v. *FCC*, 444 F.2d 841, 850, 851 (2 quotes) (D.C. Cir. 1970), *cert denied*, 403 U.S. 923 (1971) (footnotes omitted).

B. The Court of Appeals Correctly Found the Rulemaking Record Substantively Deficient on the Issue of High-Level Waste Disposal

The Petitioner, intervenors Baltimore Gas and Electric Co., *et alia*, and the Federal Respondents have argued that the Court of Appeals decision should be reversed because the Court improperly intruded into the discretion of the Commission to select procedures for decision-making. (Brief for Petitioner, Vermont Yankee Nuclear Power Corp. 30-39; Brief for Baltimore Gas and Electric Company, *et al.*, 22-34; Brief for Federal Respondents 36-50.) The Court of Appeals, however, not only expressly disclaimed any intrusion into the Commission's selection of procedures,[24] but also set forth a detailed explanation of the basis for its decision:

> ". . . [*W*]*here apparently significant information has been brought to its attention, or substantial issues or policy or gaps in its reasoning raised, the statement of basis and purpose must indicate why the agency decided the criticisms were invalid.* Boilerplate generalities brushing aside detailed criticism on the basis of agency 'judgment' or 'expertise' avail nothing; what is required is a reasoned response, in which the agency points to particulars in the record which, when coupled with its reservoir of expertise, supports its resolution of the controversy. *An agency may abuse its discretion by proceeding to a decision which the record before it will not sustain, in the sense that it raises fundamental questions for which the agency has adduced no reasoned answers.*"

[24] The Court of Appeals explicitly stated:

> ". . . it is not proper for a reviewing court to prescribe the procedural format which an agency must use to explore a given set of issues. Unless there are statutory directives to the contrary, an agency has discretion to select procedures which it deems best to compile a record illuminating the issues." 547 F.2d 644; *App.* 45 (footnotes omitted).

547 F.2d 633, 646; *App.* 50 (footnotes omitted) (emphasis added).

An issue relating to judicial review of agency procedures is simply not before the Court. The Commission, in its revised rulemaking after the Court of Appeals decision, has utilized only notice and comment procedures to develop an "interim" rule, and will use the procedures originally developed in the Table S-3 hearing to adopt a final rule. 41 *Fed. Reg.* 45849 (Oct. 18, 1976); 42 *Fed. Reg.* 13803 (March 14, 1977); 42 *Fed. Reg.* 26987 (May 26, 1977). It is disingenuous for the Commission to argue that it is hamstrung with procedural burdens, when in fact the Court decision has been interpreted not to mandate any such obligations. Both the Petitioner and the Commission only attempt to dissuade this Court from focusing upon the central ruling of the Court of Appeals which held that the grounds upon which the Commission acted could not sustain its actions as legal. *See, e.g., SEC* v. *Chenery Corp.*, 318 U.S. 80, 94-95 (1943).[25]

[25] The line of informal rulemaking decisions cited by the Court are consistent with the primary focus of judicial review—to ensure the reasoned exercise of administrative discretion. *See, e.g., Ethyl Corp.* v. *EPA*, 541 F.2d 1, 33-37 (D.C. Cir. 1976) (en banc), *cert. denied*, 426 U.S. 941 (1976); *Portland Cement Ass'n* v. *Ruckelshaus*, 486 F.2d 375, 393-95 (D.C. Cir. 1973), *cert. denied*, 417 U.S. 921 (1974); *Mobil Oil Corp.* v. *FPC*, 483 F.2d 1238 (D.C. Cir. 1973); *International Harvester* v. *Ruckelshaus*, 478 F.2d 615, 630-32, 648-49 (D.C. Cir. 1973); *Appalachian Power Co.* v. *EPA*, 477 F.2d 495, 506-07 (4th Cir. 1973); *Walter Holm & Co.* v. *Hardin*, 449 F.2d 1009, 1015-16 (D.C. Cir. 1971); *Greater Boston Television Corp.* v. *FCC*, 444 F.2d 841, 850-51 (D.C. Cir. 1970), *cert. denied*, 403 U.S. 923 (1971); *American Airlines* v. *CAB*, 359 F.2d 624, 629-33 (D.C. Cir. 1966) (en banc), *cert. denied*, 385 U.S. 843 (1966). The opportunity to participate in formal agency decision-making is protected by adherence to "the principle of assuring challengers timely access to the critical reasoning process of the agencies." Williams, *"Hybrid Rulemaking" under the Administrative Procedure Act: A Legal and Empirical Analysis*, 42 U. Chi. L. Rev. 401, 455 (1975). By at least demanding a reasoned response to public critiques, the judiciary

1. *Dr. Pittman's Testimony on High-Level Waste Management and Disposal is Factually Inadequate to Support the Commission's Table S-3 Rule*

The factual basis for the Commission's conclusion that the problems of high-level radioactive waste disposal are negligible was the testimony of one witness, Dr. Frank K. Pittman. *App.* 776-800. In that testimony, Dr. Pittman discussed an allegedly "proven" method of storing radioactive wastes in a "Retrievable Surface Storage Facility." *App.* 777-788. He concluded that this type of facility could be available in the 1980's and could store high-level radioactive wastes for up to 100 years. *App.* 778-779, 1300. But, as the Commission's staff acknowledged, Dr. Pittman's brief presentation was . . . "the first public release of the *preliminary concepts* for the Federal Repository and provides a summary of the cur-

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can effectively require a full consideration of relevant facts and a fair resolution of issues. As Judge Friendly has noted,

> "It is thus not too consequential whether a court invalidates a rule on the ground that the procedures have not developed substantial evidence to support it or even evidence adequate to rebut a claim that it is arbitrary and capricious, or, instead, takes the route of prescribing ad hoc procedural requirements in addition to those of Section 553. . . . There will continue to be cases of rulemaking in which, in order to show that its action is supported by substantial evidence or even to avoid characterization of its actions as 'arbitrary and capricious,' the agency must provide *'some mechanism for interested parties to introduce adverse evidence and criticize evidence introduced by others.'* Just what mechanism must be provided will depend on the interests at stake, the complexity of the issue, and the usefulness of the particular mechanism as weighed against its adverse effects." Friendly, *Some Kind of Hearing*, 123 U. Pa. L. Rev. 1267, 1314 (1975) (footnotes omitted) (emphasis in original).

Here the Commission has failed even to confront the principal environmental issues at stake. Until this effort is made, the issue of the fairness of the procedures used would not be ripe for judicial review.

rent status and potential environmental effects of the high-level waste *interim storage facility. . . .*" 547 F.2d at 647 n.44; *App.* 53 n.44 (emphasis added).

Dr. Pittman also mentioned "other potential concepts" for long-term high-level waste disposal. As the Commission admits, a "Retrievable Surface Storage Facility" would be a temporary measure for use until a long-term high-level waste disposal method was developed. *App.* 1292. Dr. Pittman states that ". . . [t]he major current effort is to bring the beeded salt concept, about which so much is known, to the point of proven acceptability by the construction and operation of a pilot facility. . . ." *App.* 789. He also indicates that other research and development efforts are under way:

> "In addition to the rather extensive program of research, development, testing, design, construction and pilot plant operation underway on the bedded salt concept, the Commission is currently making a thorough evaluation of all other potentially attractive near- and long-term disposal concepts in order to: (1) assure that no feasible concept has been overlooked; and (2) lay the groundwork for future programs, should the work on bedded salt not result in acceptability of that concept for very long-term disposal."

App. 790-91. Without any further explanation of "what is known" about bedded salt, or the environmental risks and research and development costs involved in other "concepts", Dr. Pittman set forth his salient conclusions:

> "(1) the program being followed by the industry under AEC regulation and by the AEC offers assurance that the commercial high-level wastes will be managed safely from its initial production; (2) the surface storage method, to be used by the AEC, is good for as long as adequate human surveillance and maintenance effort is continued; (3) the prob-

> ability that work currently underway will demonstrate the use of bedded salt as a safe, acceptable, ultimate disposal method within the next 10 to 15 years is very high; (4) should bedded salt not prove to be acceptable, other acceptable geologic disposal concepts offer reasonable probability of reaching a point of acceptability within two or three decades; and (5) the waste in initial storage will be easily retievable for either near- or far-term disposal methods when they are developed." *App.* 791.

Dr. Pittman's testimony neither discusses the issues in depth nor considers all relevant factors. His only detailed examination of any high-level waste management technology concerned short-term retrievable storage. But short-term storage is not equatable with long-term disposal. The environmental effects of producing radioactive wastes must be endured for up to 250,000 years. "Short-term" storage could not make those effects negligible or capable of description by reference to a table of numerical values. The present choice of placing radioactive wastes in short-term storage will leave the most severe environmental hazards for resolution by future generations. Further, the government has now abandoned its efforts to develop Retrievable Surface Storage Facilities (RSSF), thus making Dr. Pittman's testimony of radioactive waste disposal irrelevant.[26]

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[26] A draft environmental impact statement was prepared on the RSSF program. *Management of Commercial High Level and Transuranium-Contaminated Radioactive Waste*, AEC WASH-1539 (Sept. 1974). The adequacy of the statement was strongly criticized, and it was subsequently withdrawn. The RSSF concept was abandoned pending a "comprehensive reevaluation of the federal program in this critical and controversial area." Letter of R. Seamans, Administrator of ERDA to the Chairman, Joint Committee on Atomic Energy (April 9, 1975). 547 F.2d at 648 n. 47; *App.* 55 n. 47. When the decision to abandon the development of a RSSF, the Commission made no effort to revise the Environmental Survey or the Table S-3 rule. Apparently, the Commission stands behind the remainder of Dr. Pittman's testimony as a factual predicate for the validity of the rule.

The testimony on a long-term radioactive waste disposal can be described—at best—as vague. No factual or technical basis is set forth to support the conclusion that radioactive wastes will have only the impact upon the human environment stated in Table S-3 over the hundreds of thousands of years of their toxic radioactivity. Dr. Pittman did not even conclude that a method of waste disposal has yet been proven environmentally and economically acceptable. *App.* 789-91. He only concluded that it is "reasonably probable" that one method of waste disposal will "reach a point of acceptability." His prognosis of "reasonable probability" is not supported by any discussion or analysis of what techniques may be used and how the application of these techniques may succeed in permanently isolating radioactive wastes from the human environment.

It is not surprising, given the glibness of Dr. Pittman's assurances, that the possibility of technological failure is blithly cast aside. Dr. Pittman asserted that if the prime long-term isolation method, disposal in bedded salt deposits, does not materialize, other technologies are *"being developed."* *App.* 791. But no explanation of what the phrase "being developed" means or may involve was given. Relevant facts concerning the costs, risks, and uncertainties of developing a satisfactory disposal method were ignored.

The research effort to develop a method of radioactive waste disposal is significantly more complex than Dr. Pittman's testimony indicates. In 1972, Dr. Pittman himself candidly concluded that:

> "While none of the suggested long-term solutions to the problem of permanent disposal of high-level radioactive waste is technically or economically feasible today, the Atomic Energy Commission recognizes that one or more may well offer attractive options in the future. For this reason, the Com-

> mission will continue programs of study, evaluation and experimentation on promising future disposal methods, and will conduct its radioactive waste management program in a way which will not preclude use of such techniques should they become available in the future." [27]

Despite the number of alternatives *potentially* available, the suitability of *any* one means of permanent radioactive waste disposal has not been demonstrated. An actual program of implementing an option that will provide for the protection of the health and safety of the public and the "human environment" is still remote. The current state of the art of radioactive waste disposal remains investigatory and focused upon research and development programs. In citing the findings of a 1975 ERDA Task Force on the "Nuclear Fuel Cycle" (upon which Dr. Pittman served), the Court below succinctly summarized the nature of current problems and uncertainties:

> "The unanimous task force concluded, *inter alia*, 'there are still many technical problems and uncertainties in the overall area of processing of spent fuel and managing its waste', [*Nuclear Fuel Cycle: A Report of the Fuel Cycle Task Force*, ERDA-33 (March 1975)] 40; '[t]he costs of storage and ultimate disposal . . . are very much higher than had previously been assumed . . .', *id.*, 46; '[the public] fear[s] that the radioactive waste generated . . . will either be neglected, and thus place an unacceptable hazard potential on mankind, or be managed in a way that will place an unacceptable burden on future generations to assure continued public safety. [T]hese . . . fears . . . are supported by a fair segment of the scientific community—many of whom

[27] Pittman, F. K., *Management of Commercial High-Level Radioactive Waste* 17 (paper delivered at the Massachusetts Institute of Technology, July 25, 1972).

> otherwise support the use of nuclear reactors for the generation of electric power.' *id.*, 49-50."

547 F.2d at 650 n.51; *App.* 60 n.51.

The underlying uncertainties and problems in the search for a solution to the long-term disposal question were brought clearly to the Commission's attention in the rulemaking proceedings. The history of recent failure to implement the "most promising" disposal technology, salt mine disposal, was discussed by *amicus curiae*. *App.* 894-896, 1072-1107. This history was ignored by Dr. Pittman, and accordingly by the Commission, even though it illustrates the actual status of waste management and disposal techniques. Solutions are clearly not in hand. Gradual progress toward the demonstration of the feasibility of techniques, determined *in unconfirmed theory* to be adequate for the job by various technician experts, is continuing.

The Commission's investigation of a salt mine in Lyons, Kansas to demonstrate high-level waste disposal indicated that radioactive wastes are not a "non-problem." The Commission had "planned" to dispose of wastes in bedded salt deposits as early as 1957, but its first effort to implement heretofore theoretical plans at Lyons proved a dismal failure. After the Kansas Geological Survey raised serious concerns about both the suitability of the site and the sufficiency of the Commission's evidence that salt disposal would prevent radioactive dispersion and seepage in the biosphere, the site was abandoned. Dr. William Hambleton, Director of the Kansas Geological Survey, concluded from his investigation that ". . . the Lyons site is a bit like a piece of Swiss cheese, and the possibility for entrance and circulation of fluids is great." [28] Therefore, a great danger was posed to un-

[28] Hambleton, *The Unsolved Problem of Nuclear Wastes*, Technology Review, March/April 1972 at 15-19. Dr. Hambleton's views were read into the record. *App.* 895-96.

derlying aquifers feeding into drinking water supplies. The site lacked the geological characteristics necessary to provide a stable undisturbed disposal site for time periods up to hundreds of thousands of years. Dr. Hambleton concluded that ". . . [a]s to the general concept of burial of nuclear wastes in salt, the jury is still out." [29] *See, App.* 894-896.

The lack of a clear-cut solution to the disposal problem is further illustrated by the ongoing investigation of other alternative possibilities. In May 1976, the Energy Research and Development Administration ("ERDA") published a comprehensive survey of alternative technologies for long-term waste disposal, *Alternatives for Managing Wastes from Reactors and Post-Fission Operations in the LWR Fuel Cycle*, ERDA 76-43 (May 1976) (hereinafter cited as "ERDA Alternatives" study). That report, specifically designed *not* to be an environmental assessment or impact statement, sets forth the possible technological options for the resolution of radioactive waste problems. Significantly, the theoretically plausible solutions for long-term isolation of high-level waste proposed in the "ERDA Alternatives" study parallel the options which UCS requested the Commission to consider in its rulemaking. *App.* 1072-1107. Current ERDA plans include an investigation of a number of these options at potential sites in over thirty-five states.[30] Neither of these options nor existing ERDA plans were evaluated by the Commission in order to reach its conclusions that radioactive wastes would have an insignificant impact on the environment. However, not only is the probable success or failure of these plans critical in evaluating the environmental effects of radioactive wastes, but the plans themselves, and the need for such plans, are an impact of the production of wastes. The environmental and economic costs of long-term radioactive waste isolation are multiple, reflecting present risks and costs of the actual development efforts now in progress.

[29] *Id.*

[30] ERDA Public Release No. 76-355 (Dec. 2, 1976).

The failure of Dr. Pittman and the Commission to examine research and development programs and choices ignores broad environmental concerns within the purview of NEPA. One technical commentator has pointed out that a pursuit of diverse disposal site options and irreversible, permanent disposal technologies is imperative in order to protect future generations from the impact of our decisions and to balance short term needs against long-term comments:

> "[A]s our every act has the potential to profoundly alter future lives, our minimum ethical obligation is to examine most thoroughly the potential consequences of present actions, to acknowledge them openly, and to minimize the potential for irremedial harm.
>
> "This obligation would not be satisfied if, in the disposal of nuclear wastes, we imposed upon future societies an obligation to provide for a stability of institutions unprecedented in history, if we attempted to transfer the responsibility for accidents from our shoulders to theirs. There is no ethical or moral basis for placing social and technical requirements and obligations on future generations for the sole purpose of protecting them from the consequences of present activities and decisions. The obligation to consider the effects of errors in technology or judgment, to provide for our inability to guarantee future technical performance, social stability, and cultural continuity rests with the present."

Rochlin, *Nuclear Waste Disposal: Two Social Criteria*, *Science* Vol. 195 No. 4273 at 29 (Jan. 7, 1977).

In addition to purely technical issues, the concerns expressed by Dr. Rochlin deserve disclosure in the record.

Section 102(2)(c)(iv) of the NEPA, 42 U.S.C. § 4332(2)(c)(iv), specifically requires the Commission to analyze the relationships between short-term and long-term uses of the environment. The congressional declaration of policy in section 101(a) of NEPA, 42 U.S.C. § 4331(a), establishes a complementary commitment to ". . . fulfill the social, economic, and other requirements of present and future generations." The Senate Report states that NEPA is ". . . designed to deal with the long-range implications of many of the critical environmental problems which have caused great public concern. . . ." S. Rep. No. 91-296, 91st Cong., 2d Sess. 8 (1969). The quality of future risks created by radioactive materials alone has led some members of the scientific community to question the acceptability of large-scale power reactors where other energy production options exist:

> "I believe that the vigorous pursuit of [energy] alternatives is far preferable to the *risk of irreversible contemination* of the environment that may well result from an economy heavily dependent upon plutonium and on the other actinides that would accompany it." (Emphasis added.)

J. T. Edsall, *Toxicity of Plutonium and Some Other Actinides* in *Bulletin of Atomic Scientists* 37 (Sept. 1976).

Without a readily available means of resolving the long-term environmental problem created, a failure even to recognize the character of the potential future impact of present actions does not comply with the law. Vague assumptions will not fulfill the Commission's responsibility to make sound environmental choices which could "leave to countless future generations a permanent heritage of radioactive waste products" and their dangers.[31]

[31] In 1975, the National Council of Churches of Christ of the U.S.A. assembled a number of prominent scientists and scholars, led by René Dubos and Margaret Mead, to endorse a "Statement of Concern" about the risks of plutonium and its possible use as a reactor fuel. The background report to this statement noted,

> "There is as yet no high-level waste storage site. There is not even a credible proposal for such a storage site. This is particularly disturbing since the existence and severity of the waste storage problem has been known since the first days of the nuclear age and there has been thirty years of study and policy review. . . . The hope associated with the 'interim' storage proposals was apparently that future generations would be able to resolve a problem that this generation is finding insoluble. ERDA is now trying again to find the permanent storage site and in the meantime more waste is being generated." *The Plutonium Economy: A Statement of Concern* 16-17 (National Council of Cnurches of Christ in the U.S.A., Sept. 1975).

The final statement concluded:

> "There is additionally the fundamental ethical question of our right to leave to countless future generations a permanent heritage of radioactive waste products. In producing vast quantities of materials so deadly that they will require perpetual vigilance and guardianship, nuclear power will inject into the future an element of risk comparable to that of our vast store of nuclear arms.
>
> "These profound biological and social hazards, many without present technical solutions, or easily foreseeable solution, would be incurred in pursuit of small and possibly ephemeral economic advantages. Decisions balancing the risks of the plutonium economy with its benefits are now founded on self-serving economic and technical assessments lacking in analytical quality. They are being hastily made without the full and informed public discussion that decisions of such unique importance require." *Id.* at vi.

[32] The societal problems created by the existence of radioactive wastes include risks of sabotage and terrorism as well as the need for long-term stable management systems capable of identifying and solving problems of safeguarding repositories, correcting technical failures or stopping slow radioactive leakage. *See, App.* 903-910. A recent survey of managerial options submitted to ERDA concluded, *inter alia*, that: "[e]xisting institutional arrangements

Under these circumstances, NEPA requires a thorough examination of health and safety hazards and institutional and social commitments which may be passed on as a legacy of present decisions.[32]

2. *The Commission Provided No Reasoned Explanation for Excluding Relevant Considerations and For Concluding That Environmental Effects Are Negligible*

The grounds relied upon by the Commission to sustain its conclusion that the environmental impact of implementing a means of long-term radioactive waste disposal is negligible are essentially an intuitive leap forward to a future technological system which will resolve all foreseeable problems without risk or cost. Dr. Pittman's testimony does not develop facts or evidence which could support any other determination. However, the Administrative Procedure Act requires more than intuitive guesswork. To enforce the requirement of reasoned support of an agency rule in the record, this Court has demanded that ". . . the agency's path may reasonably be discerned." *Bowman Transportation, Inc.* v. *Arkansas Best-Freight System, Inc.*, 419 U.S. 281, 286 (1974), *citing, Colorado Interstate Gas Co.* v. *FPC*, 324 U.S. 581, 595 (1945). Some rational connection between the factual issues treated by the Commission and the conclusions drawn must be stated. (See cases cited in the text at page 43, and at note 25, *supra.*)

The lack of a reasoned basis for the Commission's rulemaking decision is initially evident from the conflict between the notice of proposed rulemaking (*App.* 352-360) and the statement of basis and purpose (*App.* 385-400). The Commission's notice of proposed rulemaking admits that a "full and frank disclosure and consideration of costs and benefits" (*App.* 355) should be made for proposed licensing of nuclear power plants. In that notice, the Commission states that the results of the application

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for management and regulation of radioactive waste are inadequate for the future." Willrich, et al., *Radioactive Waste Management and Regulation* (Report to ERDA from the M.I.T. Energy Laboratory, 1976).

of this principle to the issues of radioactive waste control "are not entirely clear". *App.* 355. The "fractional contribution" of one reactor is difficult, if not "impossible to ascertain with any degree of certainty". *App.* 355. But the public was advised that ". . . an informed consideration of the *generic questions* of the *environmental impact* associated with the uranium fuel cycle" would be undertaken. *App.* 355 (emphasis added).

Unfortunately, the Commission did not follow through with this reasoning. Rather than confronting the issues on a generic basis, the Commission developed a table of numerical values representing that "impossible to ascertain" fractional contribution of one nuclear power reactor's radioactive wastes to the environment. The purpose of the rulemaking was recast in the statement of basis and purpose accordingly:

> ". . . to provide a *data base from which numerical values could be derived* which would reflect the environmental impact associated with the uranium fuel cycle. . . [t]hese values would then be factored into cost-benefit analyses for individual reactors . . . the Environmental Survey is not an impact statement." *App.* 397 (emphasis added).

When faced with fundamental objections to a rule reducing to *certain* numerical values the acknowledged uncertainties and complexities of unresolved generic problems, such as high-level waste disposal, the Commission did not provide a reasoned response. Known uncertainities, the history of past failures to develop technologies predicted to achieve environmental protection goals, presently created long-term health risks and other factors were glossed over solely on the basis of Dr. Pittman's testimony. The Commission has cast aside these factors, because an "adequate data base" allegedly was presented in its survey. *App.* 392. Since none of the issues UCS raised were dealt with in that "data base",

the dialogue between participants in the rulemaking and the Commission was essentially a sham. The Commission apparently engaged in no probing of the record and provided no rationale for its final decision. An agency does not exercise "objective good faith" when it not only fails to seek out responsible scientific opinion concerning adverse environmental consequences (*Committee for Nuclear Responsibility* v. *Seaborg*, 463 F.2d 783, 787 (D.C. Cir. 1971), but does not even respond to those views when presented. *See also, Portland Cement Ass'n* v. *Ruckelshaus*, 486 F.2d 375, 393-94 (D.C. Cir. 1973), *cert. denied*, 417 U.S. 921 (1974).

The deficiencies of the Commission's reasoning are also clear from its responses provided to the questions raised in the "Report to the Commission by the Nuclear Fuel Cycle Hearing Board." *App.* 364-384. The Hearing Board cited very specific criticisms exposing significant issues raised in the record which should be addressed by the Commission prior to the promulgation of the rule. Those issues included: (1) ". . . the unreliab[ility of the Survey] in that it dealt with nonexistent [waste disposal] facilities. . ."; *App.* 372; (2) the lack of a ". . . full opportunity to explore and comment on the bases for the conclusions in the Survey and, hence, its substance. . ." (*id.*), especially in view of the intent ". . . to issue a substantially revised Environmental Survey", *id.*; (3) ". . . the use in the Survey of qualitatively styled and allegedly undefined descriptive phrases as a basis for conclusions regarding the magnitude of the environmental impact . . . [which] hindered full and inclusive examination of the bases for the salient conclusions. . ." *App.* 373; and (4) the possible ". . . advocacy of substitute "Alternatives" with a radically different approach. . .", *App.* 375.[38]

[38] The Commission's notice of rulemaking indicated that only two alternative means of complying with NEPA would be considered. Either radioactive waste management and disposal would be excluded totally from environmental review or the issues would be reduced to a table of numerical values. *App.* 355-57. Despite the facts brought to the Commission's attention about the uncertainties involved in future waste disposal plans, no broader alternative means of complying with NEPA were contemplated. The basic design and intent of the rulemaking was to affirm a pre-established result. The Commission did not make a reasoned choice among available alternatives upon a consideration of relevant issues. *Citizens to Preserve Overton Park* v. *Volpe*, 401 U.S. 402 (1971); *Pillai* v. *CAB*, 485 F.2d 1018, 1029-30 (D.C. Cir. 1973).

The Commission's final "statement of basis and purpose" does not confront any of these questions. First, the Commission acknowledges the argument that the Survey is unreliable and inadequate because high-level waste *disposal* facilities are non-existent. *App.* 390. The reasoning provided for the decision to dismiss this issue is that ". . . [c]onsiderable information was presented at the hearing on high-level waste *storage*, utilizing a retrievable surface storage facility". *App.* 391 (emphasis added). Yet "storage" is not the same as "disposal", and the production of radioactive wastes creates the need for long-term disposal and its environmental impacts. Dr. Pittman's only reflection on the existence of scientific opinion that the disposal problem is unresolved was to label such dissent as "unwarranted fear" and a "bugaboo". *App.* 778.

But the present reality of the state of waste disposal technology is not, by any means, an unwarranted fear or a *de minimus* environmental consequence of licensing a nuclear power plant. Over 2500 members of the scientific and technical community agreed with *amicus curiae* in a 1975 petition that the production of radioactive wastes creates such substantial long-term environmental risks, which can not be eliminated adequately with existing technologies, that Congress should delay the licensing of nuclear power plants until more prudent solutions to the problem are developed. (See text at note 3, *supra*.) Even if the Commission does not agree with

these views, it has a duty to acknowledge them, and explain its differences with the reasoning supporting them, rather than labelling such dissent a "bugaboo."

The Commission further reasons that although ". . . a waste storage facility has not been constructed. . .," all environmental impacts are known because ". . . preliminary conceptual designs have been developed using existing technology based on well established data and techniques". *App.* 392. The difference between "preliminary conceptual designs" and constructed facilities is obvious. The Commission confuses the predicted environmental impacts of design, with those of implementation and actual performance.[34] Reasoning based upon conceptualization ignores the costs necessary to develop technology from drawingboard concepts to actual application. It also ignores the fact that concepts may be abandoned, as is the case with Retrievable Surface Storage Facilities, while the long-term disposal problem remains.

At a bare minimum, the Commission should have disclosed relevant technology development and implementation, strategies used to justify its conclusion defining risks, costs and environmental implications in order to produce an adequate record. Numerous decisions have

[34] This point was brought to the Commission's attention in the rulemaking:

> "One of the most important factors that we think is lacking in this report is the failure to distinguish between design objective on the one hand and performance on the other. The history of the Atomic Energy Commission and atomic energy in general has been one in which design has rarely been achieved and that performance has represented a significantly different figure."

App. 840. The Commission provided no response to this argument and gave no reasoned explanation for its lack of any analysis of the costs and risks of achieving actual performance of predicted technologies. Despite the use of "conservative" estimates, the Commission carefully avoided making its "estimates" even minimal performance standards or future operating limits. *App.* 396.

found this type of information essential for a reasoned judgment based upon a complete record. For instance, in *Scientists Institute for Public Information* v. *AEC*, 481 F.2d 1079 (D.C. Cir. 1973), the Court of Appeals held NEPA to be directly applicable to the technology development process. "Meaningful consideration and balancing of environmental costs" could not wait until "the ultimate application of the technology." *Id.* at 1089. In *Natural Resources Defense Council* v. *Grant*, 355 F. Supp. 280 (E.D.N.C. 1973), the Court found that where uncertainty, the need for future research and development, and unresolved environmental issues exist, an agency must consider the "deferral" of the proposal as a reasonable alternative pursuant to sections 102(2)(C)(iii) and 102(2)(E) of NEPA. *See also, Sierra Club* v. *Morton*, 510 F.2d 813, 825-26 (5th Cir. 1975). The Court in *Grant* also found that the history of success and failure of similar projects should be discussed on the record. *Natural Resources Defense Council* v. *Grant*, 355 F. Supp. 280, 288 (E.D.N.C. 1973). In *Environmental Defense Fund* v. *Hardin*, 325 F. Supp. 1401 (D. D.C. 1971), an adequate research program was considered mandatory under NEPA prior to agency action. In *Portland Cement Ass'n* v. *Ruckelshaus*, 486 F.2d 375 (D.C. Cir. 1973), *cert. denied*, 417 U.S. 921 (1974) the Court stated that ". . . [i]t is not consonant with the purposes of a rulemaking proceeding to promulgate rules on the basis of inadequate data, or on data that, to a critical degree is known only to the agency." *Id.* at 393.[35]

[35] The Commission has not even met its minimal obligation to disclose the studies and technical data upon which it could rely upon in order to assert that long-term disposal is technically feasible. NEPA requires this type of disclosure. A final EIS can be neither "too vague, too general and too conclusory," *Environmental Defense Fund* v. *Froehlke*, 473 F.2d 346, 348 (8th Cir. 1972), nor "unsupported by empirical or experimental data, scientific authorities or explanatory information of any kind." *Natural Resources Defense Council* v. *Grant*, 355 F. Supp. 280, 287 (E.D.N.C. 1973).

The further critique by the Hearing Board (*App.* 373) of the "undefined descriptive phrases" supporting the salient conclusions on waste disposal is also blandly dismissed by the Commission. The Commission does not elaborate the basis for the rule, but only suggests a possible expansion of the range of numerical values which could be presented. *App.* 393. The assumption that numerical values themselves are adequate is never questioned by the Commission in light of the record:

> "The Commission believes that providing ranges of variables relevant to assessing environmental impact would serve little or no constructive purpose here since conservatism was utilized in deriving the Summary Table values, and thus, these values already reflect an environmental impact greater than that which is truly anticipated."

App. 393. Unfortunately the Commission misses the point of the Hearing Board's questions based upon the objections in the record. In view of the record, the Hearing Board asked not only whether a range of variables should be presented, but also whether ". . . more extensive analyses of the long-term environmental effects of, among others, waste storage and/or disposal are required to sustain the validity of the conclusions reached . . ." *App.* 374. This latter question raises the essential problem which concerns the rational basis for the disclosure of only predictive numbers concerning the impacts of undeveloped and, in the case of high-level waste disposal, unknown technologies. In short, what foresight enabled the Commission to draw "conservative" numerical conclusions?

The Commission dismisses the need to examine alternative waste disposal technologies itemized in UCS's comments (*App.* 1084-1098), and characterized by Dr. Pittman as under investigation (App. 777), because "conservatism was utilized" whenever it was not possible "to

produce numerical values reflecting real or actual environmental impact" *App.* 397. Conservatism, whatever it may mean as a system of reasoning, is used here as a system of making empirical judgments without a record of factual evidence. The promulgated rule is based on a method of "crystal ball" prophecy of future numerical values, and can not be sustained on the administrative record. *See, International Harvester* v. *Ruckelshaus*, 478 F.2d 615, 629 (D.C. Cir. 1973); *Environmental Defense Fund* v. *Ruckelshaus*, 439 F.2d 584, 597 (D.C. Cir. 1971).

Finally, the circumstances clearly are not analogous to the situation in *Carolina Environmental Study Group* v. *United States*, 510 F.2d 796 (D.C. Cir. 1975). In that case, the Commission provided very little detail in an EIS concerning the consequences of the most severe class of postulated nuclear power plant accidents. The Commission had previously conducted extensive and complex risk assessment studies based on existing technology which concluded that this class of accident was exceedingly unlikely. *Id.* at 799-800. In contrast, the only "unlikelihood" associated with long-term radioactive waste disposal is the capacity and availability of technology to protect the environment from severe consequences. A risk assessment study has not been made by the Commission. In reviewing future technology development, no attempt has been made by the Commission to "accept certain areas of uncertainty" or to "assess or characterize the strengths and weaknesses of opposing arguments" in any meaningful way. *See, Ethyl Corp.* v. *EPA*, 541 F.2d 1, 23-27 (D.C. Cir. 1976) (en banc), *cert. denied*, 426 U.S. 941 (1976); *Reserve Mining Co.* v. *EPA*, 514 F.2d 492, 507 n.20 (8th Cir. 1975) (en banc); *Amoco Oil Co.* v. *EPA*, 501 F.2d 722, 741-42 (D.C. Cir. 1974), *cert. denied*, 417 U.S. 921 (1974).

If allowed to stand by this Court, the Commission's action would amount to a conclusion of law that even the

most serious environmental consequences of agency action need not be recognized, disclosed or evaluated in detail because a single expert believes that these consequences can be handled at some uncertain geographic location, in some uncertain manner, at some unknown cost, by some technical means which may or may not be suited for the task.

III. EXPERT JUDGMENTS WITHIN AGENCY DISCRETION WILL NOT BE DISTURBED BY A JUDICIAL REMAND WHICH REQUIRES A FAIR DISCLOSURE OF ENVIRONMENTAL PROBLEMS UNDER NEPA

A. Introduction

The Commission's reduction of all foreseeable environmental effects of the production of radioactive wastes to a vague statement in the *Vermont Yankee* EIS and an insignificant series of numerical values in the Table S-3 rule raises highly technical and complex matters for judicial scrutiny. But, as this Court has stated:

> "Reviewing Courts are not obliged to stand aside and rubberstamp their affirmance of administrative decisions that they deem inconsistent with a statutory mandate or that frustrate the Congressional policy underlying a statute. Such review is always properly within the judicial province, and courts would abdicate their responsibility if they did not fully review such administrative decisions."

National Labor Relations Board v. *Brown*, 380 U.S. 278, 291-92 (1965). The mere technical complexity of the issues can not preclude a probing judicial scrutiny of the consistency between allegedly "expert" judgments made by the Commission and the legislative intent underlying NEPA. As Professor Jaffe has noted:

> "The respective fields of agency and court cannot be marked off in terms of their comparative competence to deal exclusively, one with a certain class of questions, the other with another class. We have seen that administrative decisions do not lend themselves to a classification of "purely" expert, partially expert, and not-at-all expert. The expert may make judgments which are highly relevant to a determination of validity. *But ultimately the court is asked to answer and must answer the question: does the action comport with the purposes and meaning of the statute as the court sees it?* This inquiry cannot, or at least should not, be evaded by an appeal to the presence or potential presence of technical considerations."

L. Jaffe, *Judicial Control of Administrative Action* 584 (1965) (emphasis added). Judicial remand of the Commission's treatment of radioactive waste management and disposal issues should demand compliance with the two basic standards of NEPA: "full disclosure" and "appropriate consideration" of environmental problems.

The legislative goals of NEPA are not to allow agencies to make closed-door expert judgments concerning their subjective attitude toward environmental problems. Rather, NEPA requires that the nature of environmental implications of federal actions be fully explained consistently with the action-forcing positions of the law. This mandate includes a requirement to present dissenting views and sufficient reasoning why environmental effects are outweighed by other considerations of national policy. This process of objectively evaluating environmental problems caused by proposals for action is thus,

> "to ensure that each agency decision-maker has before him and takes into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance. Only in that fashion is it likely that the most intelligent, optimally beneficial decision will ultimately

be made. Moreover, by compelling a formal 'detailed statement" and a description of alternatives, NEPA provides evidence that the mandated decision-making process has in fact taken place and, most importantly, allows those removed from the initial process to evaluate and balance the factors on their own." *Calvert Cliffs Coordinating Committee* v. *AEC*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

* * * *

"NEPA assumes as inevitable an institutional bias within an agency proposing a project and erects the procedural requirements of § 102 to insure that 'there is no way [the decision-maker] can fail to note the facts and understand the very serious arguments advanced . . . if he carefully reviews the entire environmental impact statement.'" *Environmental Defense Fund* v. *Corps of Engineers*, 470 F.2d 289, 295 (8th Cir. 1972) (footnotes omitted).

Here, the basic design and intent of the Commission's reduction of environmental concerns to numerical values is totally contrary to the standards of full disclosure and appropriate consideration. The Commission's action must therefore be remanded under the APA as both "arbitrary and capricious" and "without observance of procedure" required by NEPA. 5 U.S.C. § 706(2)(A) and (D).

B. The Commission's Table S-3 Rule Defeats the Full Disclosure Purpose of NEPA

Within the procedural standard set forth in section 102(2)(C) of NEPA, the Commission has a great degree of flexibility to implement the "action-forcing" mandate in a meaningful and effective manner relative to specific generic issues raised by nuclear power plant licensing, such as radioactive waste production. *See generally, Note, The Use of Generic Rulemaking To Resolve Environmental Issues In Nuclear Power Plant Licensing*, 61 Va. L. Rev. 869 (1975). Certainly there is much

to be gained by a generic analysis of significant environmental issues applicable to all nuclear power plants in a similar manner, and having substantial cumulative effects requiring a uniform commitment of resources. *See, Union of Concerned Scientists* v. *AEC*, 499 F.2d 1069 (D.C. Cir. 1974); *Ecology Action* v. *AEC*, 492 F.2d 998, 1002 (2d Cir. 1974) (Friendly, J.).

However, the use of generic procedures can not conflict with the meaningful disclosure and fair assessment of environmental issues contemplated by the "action-forcing" impact statement procedures of section 102(2)(C). As one Court of Appeals has noted, it must be recognized, ". . . on one hand that [NEPA] mandates that no agency limit its environmental activity by the use of an artificial framework and on the other hand that the act does not intend to impose an impossible standard on the agency." *Environmental Defense Fund* v. *Corps of Engineers*, 492 F.2d 1123, 1131 (5th Cir. 1974).

The difficulty with the Commission's framework of decision-making is that any form of oversight by Congress or the public is precluded. 547 F.2d 651; *App.* 62. Rather than generating a full record of possible future environmental consequences, the Commission has hidden behind an arrogant failure to respond to critiques to its conclusory assumptions. The Commission proposes a rule that it is incomprehensible even to an informed, technically trained observer. It neither alerts the public to foreseeable environmental crises, nor explains why the Commission views these crises to be manageable. In short, the means whereby "Table S-3", reprinted in individual power plant impact statements, will provide ". . . a systematic feedback to Congress and the public on the environmental costs of implementing programs . . ." (*App.* 38 n.15) remain unknown. The only material concerning the environmental impact of radioactive wastes which will be circulated to the Congress, the

President's Council on Environmental Quality, state and local government, other interested federal agencies and the public will be "Table S-3" reprinted as one page of each individual nuclear power plant impact statement. The generic discussion, as limited as it was, will be hidden away in the files of the Nuclear Regulatory Commission, not subject to public scrutiny and incorporation into the decision-making process through the procedures required by NEPA.

The issuance of an "environmental survey" by the Commission in the place of the "detailed statement" required by section 102(2)(C) has been rejected once previously. *Scientists Institute for Public Information* v. *AEC*, 481 F.2d 1079, 1084-94 (D.C. Cir. 1973). In *SIPI* it was unequivocally stated that the procedural requirements of section 102(2)(C) are:

> ". . . not indispensible technicalities, but crucial if the statement is to serve its dual functions of informing Congress, the President, other concerned agencies and the public of the environmental effects of agency action, and of ensuring meaningful consideration of environmental factors at all stages of agency decision-making."

Scientists Institute for Public Information v. *AEC*, 481 F.2d 1079, 1091 (D.C. Cir. 1973) (footnotes omitted). Here, the Commission is again not only content to avoid discussion of the environmental consequences of its actions by circumventing the explicit procedures of section 102(2)(C), but it also concludes that generic analysis can reduce the disclosure of controversial environmental problems beyond any form of rational comprehension.[36]

[36] Once the Commission chooses to proceed by generic consideration of environmental issues, *amicus curiae* suggests that it either must prepare a generic impact statement or conduct a rulemaking proceeding in order to determine the quality of information which should be included in individual impact statements accompanying each "major federal action." If the latter course of action is taken, the result reached in the rulemaking must be included in individual impact statements which would be circulated to interested federal agencies, the public, state and local officials, *et cetera*, for comment. *See*, 10 C.F.R. §§ 51.24, 51.50; 40 C.F.R. §§ 1500.3, 1500.7, 1500.9-1500.11. Further, the result reached in rulemaking must be rationally consistent with the full disclosure mandate of NEPA. A rule so developed must be based upon an adequate record and must inform those who read impact statements of all relevant environmental factors and the reasoning supporting the Commission's analysis of those factors. E.g., *Silva* v. *Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973); *Sierra Club* v. *Morton*, 510 F.2d 813, 819-20 (5th Cir. 1975).

Congress itself is vitally concerned with the information generated by agency compliance with NEPA. In fact, the appropriate body of government to reach a conclusion of law that radioactive wastes are environmentally acceptable is not the Commission, but Congress. National programs can be reworked through the legislative process after agencies have applied their expertise to achieve full disclosure of environmental effects. As the Senate Report accompanying NEPA notes:

> "Many older operating agencies of the Federal Government, for example, do not at present have a mandate within the body of their enabling laws to allow them to give adequate attention to environmental values. In other agencies, especially when the expenditure of funds is involved, an official's latitude to deviate from narrow policies or the "most economical alternative" to achieve an environmental goal may be strictly circumscribed by congressional authorizations which have overlooked existing or potential environmental problems or the limitations of agency procedures. There is also reason for serious concern over the activities of those agencies which do not feel they have sufficient authority to undertake needed research and action to enhance, preserve, and maintain the qualitative side of the environment in connection with development activities."

S. Rep. No. 91-296, 91st Cong., 1st Sess. 14 (1969). The Commission's "artificial framework" of decision-making, cast in the mystique of technical expertise, sweeps known environmental consequences under the rug, rather than ensuring that Congress fully scrutinizes them. *Silva* v. *Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973).[87]

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[87] Petitioner's argument that Congress has already waived the application of NEPA to the production of radioactive wastes by nuclear power plants (Petitioner's Brief 46-51) is totally unwarranted. The Energy Reorganization Act of 1974, 42 U.S.C. §§ 5801 *et seq.*, §§ 5841 *et seq.*, was enacted ". . . to separate the regulatory functions of the Atomic Energy Commission from its developmental and promotional functions. . ." (S. Rep. No. 93-980, 1974 U.S. Code & Cong. News 5483 (1974), not tacitly to approve of a broad NEPA exemption. Further, the application of NEPA to the issue of radioactive wastes by the Commission will not inevitably bring the nuclear industry to a halt. NEPA does not demand that the Commission reach particular substantive results. But NEPA does "direct[] all agencies to assure consideration of the environmental impact of their actions in decision-making." 115 *Cong. Rec.* 40416 (1969) (remark of Senator Jackson). In *Calvert Cliffs' Coordinating Committee* v. *AEC*, 449 F.2d 1109 (D.C. Cir. 1971), NEPA's mandate to consider environmental issues along with other statutory concerns was made clear:

> "NEPA . . . makes environmental protection a part of the mandate of every federal agency and department. The Atomic Energy Commission, for example, had continually asserted, prior to NEPA, that it had the statutory authority to concern itself with the adverse environmental effects of its actions. Now, however, its hands are no longer tied. It is not only permitted, but compelled, to take environmental values into account. Perhaps the greatest importance of NEPA is to require the Atomic Energy Commission and other agencies to *consider* environmental issues just as they consider other matters within their mandate."

449 F.2d at 1112.

After federal agencies have reached decisions based upon a complete record disclosing the environmental impacts of their decisions, Congress, of course, could reconsider the balance struck by the agency. The purpose of NEPA is in part to ensure that information concerning the most serious issues of national environmental policy are brought to congressional attention.

C. The Methodologies Used by the Commission to Develop Table S-3 Do Not Give Appropriate Consideration to the Full Impact of Producing Radioactive Wastes

The Commission limits the discussion of radioactive wastes by use of two methodologies in the rulemaking proceeding: (1) the development of a series of values for a cost-benefit analysis; and (2) the prediction of future effects limited only to those numerical values. These methodologies reduce environmental issues beyond recognition, instead of providing a means for "appropriate consideration" of environmental values. The purpose of the Commission's rulemaking methodologies was not to describe environmental impacts, but to develop a "data base" for the adoption of a regulation limiting disclosure to values in a fully qualified "cost-benefit analysis." *App.* 386, 392. The reliance upon cost-benefit analysis as the sole means of disclosing environmental impacts hardly signifies in and of itself that environmental matters are considered "to the fullest extent possible" in an impact statement. 42 U.S.C. § 4332. Quantification of environmental values in a cost-benefit analysis is by no means the shibboleth of meaningful environmental assessments under NEPA. Compare *Environmental Defense Fund* v. *Corps of Engineers*, 492 F.2d 1123 (5th Cir. 1974), with *Environmental Defense Fund* v. *Armstrong*, 487 F.2d 814 (9th Cir. 1973), *cert. denied*, 416 U.S. 974 (1974); *see generally, Note, Cost-Benefit Analysis in the Courts: Judicial Review Under NEPA*, 9 Georgia L. Rev. 417 (1975).

The National Environmental Policy Act specifically requires that the Commission shall:

> "identify and develop methods and procedures . . . which will insure that *presently unquantified environmental amenities and values may be given appro-*

priate consideration in decision-making along with economic and technical considerations;"

42 U.S.C. § 4332(2)(B) (emphasis added). By adopting this language, Congress concluded that environmental amenities may be unquantifiable at the present time, and an effort to define them in purely "quantified" or numerical figures may not result in "appropriate consideration". The Senate Report accompanying NEPA specifically designated this section to require the development of methodologies for full consideration of environmental factors:

> "In the past, environmental factors have frequently been ignored and omitted from consideration in the early states of planning because of the difficulty of evaluating them in comparison with economic and technical factors. As a result, unless the results of planning are *radically revised at the policy level*—and this often means the Congress—environmental enhancement opportunities may be foregone and unnecessary degradation incurred. A vital requisite of environmental management is the development of adequate methodology for *evaluating the full environmental impacts and the full costs* of Federal actions."

S. Rep. No. 91-296, 91st Cong., 1st Sess. 20 (1969) (emphasis added).

The Commission's exclusive reliance upon its quantified cost-benefit analysis does not disclose the full impact produced by radioactive wastes. Quantification of the environmental effects of radioactive wastes only in terms of theoretical end result effluents not only treats these environmental issues in an impermissibly limited matter, but also precludes consideration of the costs and impacts involved in the process of reaching or failing to reach projected results. Numerical values disclose very little about the risks and costs of the long-term environmental

problems engendered by the production of radioactive wastes. Even if quantified values were significant, the Commission has neglected even to quantify the most readily quantifitable value—the economic costs of environmental protection from radioactive wastes.

The Commission's complementary methodology, allowing it to derive its values, is the art of numerical predictions. Future predictions, supported solely on the basis of alleged "expertise" and "conservatism", are also inconsistent with the basic premises of NEPA. The mandate of section 102(2)(C) of the Act is not to prophecize the unknown, but to make a detailed accounting of the actual *present* impacts, possible adverse consequences, the "relationship between *local short-term uses* of man's environment and the maintenance and enhancement of long-term productivity and "*irreversible and irretrievable commitments of resources*" of specific actions. 42 U.S. 4332(2)(c)(i), (ii), (iv), (v) (emphasis added). Mere predictions of numbers representing the end results of underdeveloped and unknown actions necessary to reduce present risks of environmental contamination and forestall a future crisis hardly inform the public or Congress what irreversible costs and risks can be expected as necessary in order to achieve the goals of environmental preservation.

Predictions and quantifications must be subject to the restraint of reasonableness. *International Harvester* v. *Ruckelshaus*, 478 F.2d 615, 629 (D.C. Cir. 1973). Rather than reflecting a reasoned basis, the Commission's chosen methodologies for complying with NEPA rests upon unexplained assumptions about technological progress and undeveloped means of environmental protection. Even though grave doubts that the reliability of these assumptions were brought to the Commission's attention (see pages 17-22, 58-66 *supra*), the Commission gave absolutely no consideration to revising its methodologies, to jus-

tifying its rule with reasoned conclusions drawn from the record, or to expanding the scope of rulemaking to include both a detailed analysis of controverted issues and a presentation of the full dimensions of the radioactive waste disposal problems. Affirmance of the assumptions and methodologies used by the Commission to support its minimal consideration of the environmental impact of producing radioactive wastes would substitute a rule of expertise by speculation in place of a rule of law by full disclosure. By passing NEPA, Congress established its unwillingness to make this substitution.

IV. CONCLUSION

For the reasons stated above, the decisions of the Court of Appeals on review in No. 76-419 should be affirmed and the case remanded to the Nuclear Regulatory Commission for further proceedings consistent with the opinion of this Court.

Respectfully submitted,

GEORGE C. DEPTULA
1208 Massachusetts Avenue
Cambridge, Massachusetts 02138

Attorney for Amicus Curiae

Union of Concerned Scientists Fund, Inc.

Of Counsel:

JAMES N. BARNES
Center for Law and Social Policy
1751 N Street, N.W.
Washington, D.C. 20036